EDITORIAL

Under Siege

Michael Fernandez and Rachel E. Scott

There isn't any other way to put it: libraries are being attacked by the current US presidential administration. The latest salvo is part of a broader culture war strategy to dismantle institutions supporting education, research, and knowledge sharing, all of which are core principles of the library's mission. As we prepare this issue for publication in the spring of 2025, daily executive orders, directives, and announcements have led to unprecedented levels of uncertainty. Given the rapid deluge of attacks, the outlook could be markedly worse by the time you're reading this in July.

Federally funded grants have been terminated—taking personal and professional tolls on the information landscape.[1] The widespread termination of National Institutes of Health grants will have direct impacts on research at universities that are likely to be absorbed institution-wide, including library budgets. Even closer to home is the executive order that largely eliminates the Institute of Museum and Library Services (IMLS).[2] The IMLS, through its grants to state library associations and other programs, provides support to libraries of all sizes and types, including academic, public, school, and special libraries. The effective shuttering of the IMLS is a direct attack on libraries with dubious legal grounding; it's been noted that most IMLS grant funding is nondiscretionary, mandated by Congress, and therefore outside the purview of any executive order.[3] Up to this point, the Republican-controlled "non-player Congress" has exerted no agency of its own to challenge any executive orders, and that shows no sign of changing before the midterm elections.[4]

Information professionals are facing chaos and disruption at every turn, with long-held assumptions and constants upended. The upheaval has also been evident in the commercial realm; for example, Clarivate announced an abrupt end to perpetual e-book licenses.[5] Librarians, archivists, and information professionals working for the federal government have been dismissed. Our hearts are with those facing uncertainty, hardship, and loss.

In October 2024—chronologically less than a year ago, but what now feels like an alternate timeline—*Library Resources & Technical Services* published a thematic issue on the impacts of diversity, equity, inclusion, and accessibility (DEIA) on library work. The current administration has appropriated the concept of DEIA/DEI and made it a pejorative for anything they deem problematic, centering DEI at the heart of their attacks on science and research. The problematizing of DEI goes beyond the administration's perennial targeting of marginalized groups to go after any federally funded research on gender, biodiversity, or vaccines, to name but a few. Reports from the National Science Foundation have detailed grants coming under review due to containing keywords such as "disability," "ethnicity," "female," "minority," and "women."[6] In a particularly insidious weaponization of metadata, this

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"Ctrl+F" style of autocracy could also empower would be book banners to use subject headings in order to more easily identify books supporting DEI that they deem "objectionable."

Our parent organization is pushing back on this censorship, and *LRTS* applauds the efforts being made by ALA.[7] We encourage our readers to consult the resources compiled by ALA to support library advocacy in this moment of existential threat.[8] Now is the time for our community to stand up for the necessity of libraries.

In the face of so much adversity, we are committed to do our small part in bringing excellent scholarship to library workers. *LRTS* brings practitioner- and scholar-led work to the community and provides stability and continuity in times of disruption. In this issue, readers will find insight into managing streaming media, confounding variables in the open access citation advantage, the theory and implications of known item searches, inclusive cataloging practices in public libraries, and workflow considerations for the implementation of a campus procurement software.

Communication on Practice

Amauri Serrano speaks with *LRTS* Assistant Editor Michael Fernandez on their recently co-authored monograph, *Streaming Video Collection Development and Management*. In this Communication on Practice, Serrano explains the needs for a guidebook to assist library workers managing streaming collections, as well as the challenges of writing a timely and relevant how-to for a consistently shifting format.

Features

Ben Rawlins and Mitchell Scott leverage article and citation data to investigate the open access citation advantage for University of Kentucky-affiliated authors, exploring college, department, publisher, open access modality, funding, and funding source as confounding variables. They argue that this work will allow their institution to "have nuanced conversations with its authors about the ROI of OA and discuss future interventions and strategies to help authors maximize the impact of their research, with or without an APC."

In "Known item search (KIS): Theoretical and Practical Considerations," Birger Hjørland offers a critical examination of the research on KIS to argue for the importance of the concept due to its difference from subject searching and its assumption in processes including bibliographic verification and descriptive cataloging.

Yan Quan Liu and Jessica Anderson report on a survey of public librarians in Connecticut in "Adopting Critical Cataloging Practices Post Diversity Audit: Connecting the Community to Your Collection." They identify factors that promote or impede inclusive cataloging practices, such as

> "(1) appreciating the benefits of audit methods that are focused on bibliographic records, (2) recognizing the need for buy-in and participation from the entire organization, and (3) stressing

the useful integration of institutional and community feedback to improve the collection's accessibility and representation."

Notes on Operations

In "Migrating Collections Materials Purchasing from a Legacy Payments Workflow to the Campus E-Procurement Platform," Gregory Ferguson describes all aspects of this project, providing context for the legacy workflow, describing challenges encountered along the way, and outlining ongoing efforts to optimize workflows in alignment with the requirements of the campus procurement platform and finding "adoption of an outsourced system entails an extended process of filling gaps between the new system and the organization's past practices."

Book Reviews

Books reviewed include *E-Resource Licensing Explained: An A-Z Guidebook for Libraries* by Rachael Samberg, Kaie Zimmerman, Samantha Teremi, Erik Limpitlaw, and Sandra Enimil; and *RDA and Serials Cataloging*, Second Edition, by Ed Jones.

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COMMUNICATIONS ON PRACTICE

A Discussion with the Authors of Streaming Video Collection Development and Management

Amauri Serrano and Michael Fernandez

Streaming video has emerged in the last decade-plus as a crucial format for library collections. With the ascendency of this format, attendant challenges have arisen for library workers within technical services and collection development units. It was in this spirit that LRTS assistant editor Michael Fernandez and Amauri Serrano authored the recently published monograph, Streaming Video Collection Development and Management *(Bloomsbury, 2025; ISBN: 9781440880858). In lieu of a formal book review, Fernandez conducted an interview with Serrano to discuss the motivating factors for writing the monograph, the process for organizing the structure of the text, and the prospective audience who may benefit from it.*

For background, the authors began initial work on the monograph in 2022, when Fernandez and Serrano were colleagues at Yale University Library. At that time, Fernandez was working as e-resources acquisition librarian and working closely with Serrano on a quickly expanding streaming video collection. In this Communications on Practice, Serrano revisits the practical necessities of managing streaming collections at Yale that lead to the writing of the book.

MF: Hello Amauri, thanks for discussing the book with *LRTS*. To begin, what inspired you to write this book?

AS: Yale has a decentralized collection development structure with no dedicated media library or librarian. As the central collection librarian, I took on responsibility for centrally funded streaming video subscriptions and, as demand grew, became the de facto streaming video expert. However, when I arrived at Yale seven years ago, I had little experience licensing streaming video and had to quickly learn about the educational streaming market and acquisition models. Fortunately, you and I were able to collaborate and develop standardized workflows and processes for acquiring and providing access to streaming content. The book grew out of the work we did—and the knowledge we wish we had when we started.

MF: Why did you structure it the way that you did?

AS: The book is designed as a practical guide to streaming video collection management. The chapters follow the sequence of collection management activities and the e-resource lifecycle, from selection to delivery. Readers can approach it as a whole or focus on specific topics—such as budgeting, licensing, or metadata and access—depending on their needs. Ultimately, it serves as a how-to manual for practitioners.

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MF: How does this book differ from similar books on streaming video in libraries?

AS: The first thing is currency. The educational streaming video landscape is constantly changing, and previous books on the subject were published pre-2020. This book builds on those publications and offers updated guidance and approaches to managing streaming video. The second is coverage. It provides a holistic view of streaming video collection management. The amount of published literature on the subject is expansive, but there is no single publication that brings it all together.

MF: How do you write about a topic that is dynamic and consistently changing?

AS: Start by acknowledging that the landscape is evolving, and that specific details or workflows may change rapidly. However, certain foundational elements and strategies remain valuable regardless of these changes. For example, defining collection development priorities, developing negotiation strategies for licensing, and understanding assessment metrics can help libraries provide users with the content they need. By focusing on core skills, which are adaptable to different circumstances, you can create a framework that remains relevant even as the area evolves.

MF: How did you apply the day-to-day work you were doing as a collection development librarian to the chapters on selecting and budgeting for streaming acquisitions?

AS: These chapters stem directly from my collaboration with colleagues across library departments to develop a strategic approach to streaming acquisitions. Our goal was to clarify roles, responsibilities, and best practices within the organization. In many ways, the process of documenting this work over the past few years served as the first draft of these chapters. I saw the chapters as a training resource for subject librarians, which helped me write with a well-defined audience in mind.

MF: How did you go about writing from within a specific context—streaming collections at Yale—to writing for a wider audience?

AS: From the very beginning of writing this book with you, we recognized that our experience at Yale was unique and not always applicable to other institutions. However, because we had licensed a wide range of streaming content from various providers and creators, we had a broad understanding of the market and its challenges. Before coming to Yale, we also worked at smaller and public institutions with different budgets and organizational structures. These experiences helped us identify areas that needed further exploration—not only through reviewing the literature, but also by speaking with librarians from diverse institutions. To ensure a broader perspective, we conducted interviews with librarians from public libraries, community and liberal arts colleges, and master's and doctoral universities. These conversations—which we individually summarized in sections called "Streaming Vignettes"—helped balance the book by highlighting key differences between institutions and helping us clarify when certain aspects were relevant to specific types of libraries.

MF: In conducting interviews with external libraries for the Streaming Vignette sections, was there anything that surprised you?

AS: Since collection and budget management are my core responsibilities, I found it interesting to see the variety of budget structures and decision-making processes across different libraries. Some libraries relied heavily on consortia, while others had limited control over renewal decisions or the streaming video budget. In some cases, the demographics and geographical location of users influenced decisions and access to video, for example. I hadn't considered how users in rural areas, who may not have access to high-speed internet, could impact a library's decision to continue purchasing physical video.

MF: Who is this book for? How can it help them with their work?

AS: This book is for library staff who are new to streaming video or those looking to learn more about specific aspects of the streaming video lifecycle. Each chapter offers an overview of the topic, real-world examples from libraries, and practical resources such as a video collection development policy and a model streaming license that readers can adapt for their own institutions. There's also a comprehensive bibliography for further reading.

MF: What were your greatest challenges during the writing process?

AS: One of the biggest challenges was managing redundancy. Since many readers would engage with the book at the chapter level, some repetition was necessary—but we wanted to avoid unnecessary overlap. For example, we repeatedly defined different acquisition models to explain their impact on various stages of the collection lifecycle. We had to carefully decide when to reintroduce concepts and when to refer readers to other chapters instead. This required coordination, proofreading, and rewriting. On a personal level, I found it challenging to reread my own writing. Something that seemed great at first would often feel like it needed a complete rewrite when I reread it weeks later.

MF: I'll echo the challenge of striking a balance for revisiting concepts that overlap across chapters, while still making the monograph accessible to readers who may only need to refer to one or two individual chapters. Ultimately, I also hope that this monograph can be useful for any reader working with streaming collections, regardless of their institution's type, size, or budget.

FEATURE

Open Access and Citation Impact

Modality, Funding, Publisher, and Disciplinary Trends at the University of Kentucky

Ben Rawlins and Mitchell Scott

As publishers and libraries attempt to align business models and collection strategies to an ever-increasing open access (OA) publishing landscape, both have found that the message of open access citation advantage (OACA) resonates with current and prospective authors. Despite its widespread promotion and acceptance, however, OACA is not universal and is subject to ongoing debate. This quantitative study contributes to the OACA debate and research with a longitudinal focus on citation data from journal articles published 2018–2021 by University of Kentucky-affiliated authors. The article and citation data for University of Kentucky-affiliated authors are supplemented with University of Kentucky College and departmental data, providing valuable local context. In addition to author-level departmental data, this study also considers traditional confounding variables often investigated in OACA studies, such as OA modality, funding, and funding source, and introduces journal publisher as a variable for OACA analysis. This study not only provides local context for University of Kentucky Libraries, but also serves as a template that other librarians can leverage to gain insight into local OA publishing and influence how they collaborate with faculty, researchers, and publishers on how the OA landscape impacts authors, research outputs, and library collections budgets.

The open access (OA) movement emerged as a response to the increasing cost of scholarly journals and the restrictive nature of traditional publishing models that stripped authors of their rights as creators and limited access to their research. The OA movement aimed to transform how scholarly information is shared; to enhance its accessibility, transparency, overall impact of research; and give authors control over their work and its reproduction.[1] This was to be accomplished by removing barriers to access and making research freely available, thereby increasing equitable access to research and its reach.[2] Both publishers and libraries have embraced OA to advance and grow the movement in line with their respective interests.

Currently many publishers and libraries have shifted publishing and subscription models to both accommodate OA and further grow it. Due to funder mandates, the article processing charge (APC) marketplace for OA and the resulting OA models it has spawned, authors' changing perceptions of OA, and the willingness of libraries to support new OA models, there is a new alignment in the scholarly communication landscape toward OA. Publishers have seized on this opportunity and have begun shifting their publishing and business models to focus on OA, in some cases exclusively. Although

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publishers' reasons for supporting OA may vary—from aligning with the values of the academic and research community to increasing revenue opportunities—the outcome has been considerable growth in the number of OA articles published. For example, nearly 25 percent of all articles (roughly 150,000) published by Elsevier in 2022 were OA articles. The compound annual growth rate (CAGR) for OA articles for Elsevier is 45 percent, compared to the 7 percent CAGR for subscription articles.[3] Additionally, Delta Think's *Market Sizing Update 2023* highlighted that nearly half (49 percent) of all scholarly articles published in 2022 were OA, albeit fee-based OA, with an anticipated CAGR of 13 percent moving forward.[4] There was a slight decrease to 10 percent for Delta Think's 2024 projections.[5]

Libraries also increasingly align OA collection strategies with faculty and researcher expectations and engagement, often highlighting the advantages of OA in discussions and marketing. To further promote OA and the associated advantages, more and more libraries, particularly in the United States, are entering into OA agreements with publishers.[6] One of the advantages of OA that has been widely promoted by the scholarly communications community, and has resonated with authors, is the open access citation advantage (OACA). The concept of OACA suggests that articles made freely available online are cited more frequently than those behind paywalls. Advocates argue that increased accessibility leads to greater readership and, consequently, higher citation counts. This is of particular importance for faculty who may be evaluated on the citation counts of their research outputs in tenure and promotion processes. Despite its widespread promotion and acceptance, however, OACA is not, in fact, universal and is subject to ongoing debate. Some critics argue that the citation advantage may be overstated or vary across disciplines, while others question the influence of factors such as self-selection bias, publication quality, and the visibility of OA journals. Additionally, there is ongoing discussion about whether the citation advantage is primarily due to OA or other contributing factors, such as the increased availability of research through social and professional networks or whether the research and resulting publications are grant funded.

This quantitative study examines citation data from journal articles published by University of Kentucky authors 2018 through 2021, adding local context with University of Kentucky College and departmental data. It considers common OACA variables like OA modality and funding and introduces journal publisher as a new variable. The findings not only offer insights for University of Kentucky Libraries but can also guide other librarians in understanding how OA impacts authors, research outputs, and library budgets.

Literature Review

Open Access Citation Advantage

The assertion that OA articles are cited more frequently than non-OA articles first emerged in the research in 2001.[7] Since then, scholars have been divided on its existence, the confounding variables that may create it and influence it, and the environmental biases that contribute to its measurement. Numerous positions have been taken since 2001, both verifying and nullifying the existence of OACA, and this ongoing debate is best characterized and explored in Langham-Putrow, Bakker, and

Riegelman's 2021 systematic review of OACA research.[8] Their analysis of 134 OACA studies published since 2001 found that 64 (47.8 percent) confirmed the existence of OACA, 37 (27.6 percent) denied it, and 32 (23.9 percent) found that OACA exists but within subsets of populations.

The variability observed in OACA research largely stems from which confounding variables are considered and addressed in the research design. Researchers argue that a form of selection bias exists in OA, where authors select high-quality articles to be made available as OA, suggesting that this selection bias—not accessibility or readership—is the primary driver of OACA.[9] Much like OACA itself, however, the debate between author self-selection bias and user self-selection bias—the tendency of users to prefer OA articles for reading and citing due to their accessibility—has resulted in mixed findings, depending on the variables analyzed.[10] Other confounding variables often examined and proven to influence OACA variability include, but are not limited to, early view access (e.g., preprint platforms used to disseminate articles ahead of publication) and various bibliometrics associated with OA. These metrics include OA modality, the discipline of authors or journals in the dataset, and the journal's impact factor.

Why has OACA become such a focus for scholarship? Open access has often been touted as a research equalizer, ensuring equitable access to scholarship. By increasing exposure, OA scholarship is expected to garner more citations, which hold significant academic value. Davis aptly states that "citations are the indicator of scholarly impact. They measure the diffusion of new knowledge, acknowledge the contribution of peers, and, in many fields, form the basis of professional reward."[11] Therefore, gathering and reporting citation metrics to demonstrate scholarly impact has become a focus of researchers and research.

Most OACA studies to date rely on one or a combination of three sources for citation data: Scopus, Web of Science, or Journal Citation Reports. Although not included in this literature review, emerging tools like Dimensions and OpenAlex are gaining traction and are expected to become valuable resources for bibliometric research.[12] These sources provide rich metrics foundational to many OACA studies. Depending on the data source selected and the study design, these sources allow researchers to distinguish OA articles from paywalled articles, subdivide OA into its unique modalities (e.g., hybrid, gold, green), and identify articles that received research funding. They can also include impact factor and other journal metrics, in addition to bibliometrics data such as citation counts.

In developing OACA research studies, researchers employ different methods and define different samples. Some researchers focus on the corpus of scholarship within specific disciplines.[13] Others examine the work of institutional faculty within particular disciplines.[14] Some studies compare journals' OA publishing output with their paywalled content to evaluate differences in citation advantage.[15] Surveys have also been distributed to samples of institutional faculty to assess how APCs were being paid by authors to make articles OA and their underlying motivations to make an article OA.[16] Additionally, some researchers have analyzed the entire article output from specific institutions.[17]

One challenge for any OACA study, or any study evaluating faculty motivations to publish OA, lies in defining the OA modalities to be studied and whether OA categories will be grouped together and in identifying confounding variables with which to evaluate OACA. Many studies treat OA as binary, grouping gold OA and hybrid OA under one monolithic OA and paywalled content under non-OA.[18] These studies have often struggled with data sources that fail to distinguish between gold, hybrid, bronze, and platinum OA and can combine these groups into a generalized OA or exclude them in their identification. Some studies make this distinction and consider the complexities of APC publishing and its costs.[19] They also account for different paths to OA and their effects on OACA. Because many authors include APC costs in research proposals, funding can also be considered a confounding variable.[20] The traditional path of green OA and institutional repositories has also been evaluated and considered.[21]

Although the research of Langham-Putrow, Bakker, and Riegelman highlighted the inconclusive nature of OACA studies, analysis of article output and citations by various confounding variables has shown the presence of OACA. In terms of OA modality, Dorta-Gonzalez found that hybrid OA articles had twice as many citations as articles in gold OA journals, articles in gold OA journals had a lower OACA than paywalled articles, and green OA articles received 50 percent more citations than paywalled articles. Additionally, Dorta-Gonzalez found that for the forty discipline categories they investigated, 32.1 percent of the articles analyzed within these disciplines had a funding source, and funded articles saw 50 percent more citations than unfunded ones within the same OA publication modality. Within the disciplines they studied, Dorta-Gonzalez attributed the citation superiority of funded articles to a greater availability of resources for carrying out high-quality research, a greater ability to access and analyze larger datasets, and possibly, a greater ability for greater dissemination through networks and marketing efforts.[22] Boczar discovered that OACA was significantly larger for chemistry and geosciences articles, whereas other disciplines showed a small citation advantage, and one discipline, world languages, had paywalled content with a higher OACA than OA. In clinical medicine, Saravudecha found that gold OA journals, on average, received 30 percent more citations than paywalled articles.[23] Regarding the confounding variables influencing faculty to publish OA, Kirschner found that for education faculty, promotion and tenure were significant influences, and Heaton found that altruism and a sense of social responsibility were the highest motivators, followed by a perceived greater likelihood of being cited.[24]

OACA studies and their findings increasingly inform practices among academic librarians. Boczar intended their work to create a more "holistic understanding" of OACA and to inform faculty how their choice of an OA modality could affect the impact of their research.[25] Dorta-Gonzalez recommended similar advice, stating that faculty should be aware of the importance of choosing the right OA modality for their discipline and research to maximize visibility and impact.[26] Some are using OACA research and insights into faculty motivations for publishing OA to rethink strategies around transformative agreements (TA) and library subscriptions funding OA APCs. Saravudecha noted that as TAs become more widely adopted and more research shifts from paywalled to OA, it remains to be seen whether the documented OACA of OA will hold.[27] Halevi also expressed concerns with the APC model, pointing out that OA currently directs significant grant funding toward APCs, which increases publishing companies'

revenues and reduces funds dedicated to research and scientific advancement. They argued that asking libraries to cover APCs is also unrealistic.[28]

What has been missing from these studies—and could prove informative for libraries, the scholarly communications services and outreach they support, and OA deals they are evaluating—is research aligning institutional longitudinal publishing data with authors' college and departmental affiliations. By connecting University of Kentucky authors with their departments, this study contributes to the OACA discussion by examining granular institutional-based variables, such as the author's college and/or department, alongside more traditional OACA confounding variables, such as OA modality, funding, and article publisher. This approach offers a more comprehensive understanding of the institutional *why* (local context, OACA), *where* (local context and publisher), and *how* (funding, OA modality) of OA publishing. The addition of publisher as a variable to be considered is also novel and significant given publishers' varied gold and hybrid OA portfolios, as well as APC costs for OA, and libraries' greater involvement in TAs. Therefore, we believe that this study and its replicability could equip local library practitioners with nuanced insights for discussions on OA publishing and OACA and enable more informed and targeted scholarly communication strategies.

Methodology

The parameters established for this study were journal articles published by authors affiliated with the University of Kentucky, regardless of author position, from 2018 through 2021. We gathered the publication and citation data from Scopus in April 2024. Using the "Organizations" search function in Scopus, we searched for the University of Kentucky to identify all institutional affiliated publications. Results were limited by year (2018–2021), document type (article), and source type (journal). With these filters in place, a dataset of 12,450 journal articles were returned. We exported the following publication data: author(s), document title, year, source title, citation count, DOI (digital object identifier), open access, affiliations, correspondence address, and funding details. The exported data was then run through a locally developed Python script to identify and add University of Kentucky–affiliated author data to the Scopus dataset. This created new columns that included the name of the University of Kentucky corresponding or primary author or University of Kentucky–affiliated author, the University of Kentucky author department affiliation if it was listed in the affiliations, and the position(s) of University of Kentucky–affiliated authors. Additionally, we used OpenRefine to further clean the data and merge some elements together, such as publisher information and grant funding agencies. For records that did not have a University of Kentucky department affiliation identified with the Python script, we manually added the department and University of Kentucky college information. Once the data was formatted and cleaned, we created a MySQL database, an open-source relational database management system, to store, retrieve, and analyze the data. We then built a website using PHP, Bootstrap, and Highcharts to display and visualize the data outputs from the SQL queries.

Librarians replicating these methods for their local context can also use Scopus or other bibliometric databases, such as Web of Science or Dimensions, as these databases allow for searching by institutional affiliation and exporting of metadata that includes citation data and OA modality.

Data Analysis

Beyond contributing to the scholarship on this topic, we were interested to see whether the OACA exists within our local context, particularly as we continue to engage with faculty on issues related to OA publishing and publishing in general. With the data from this project, we explored and answered the following questions:

- Is there an OA citation advantage for research outputs by affiliated authors at the University of Kentucky?
- Does the modality of OA matter (e.g., is there a difference in citations between gold and hybrid OA)?
- In which University of Kentucky colleges and departments does OACA exist?
- What impact, if any, does grant funding have on the number of citations? Does the modality (paywalled, gold OA, or hybrid OA) of the grant-funded research matter when it comes to citations?
- What distinct OACA advantages exist between publishers and OA modality within those publishers' OA offerings?

Although there are many different lenses through which to analyze and evaluate citation data, this study looks at citation data overall as well as OA modality, college and department, grant funding, and publisher. Analyzing and evaluating these relationships provides a more nuanced understanding of citations and the contexts in which OACA exists.

Although we recognize the value of green OA, it was excluded from this study. For this study, we were interested in examining the citation differences between paid OA (gold and hybrid) and paywalled content to determine if, and when, an OACA exists. Additionally, there is a methodological challenge of reliably determining whether the paywalled or green OA version was cited, making it difficult to isolate and analyze its specific impact on citations.

Overall Citations Data

From 2018 to 2021, authors affiliated with the University of Kentucky published 12,540 journal articles (table 1). Of those articles, 3,073 (24.5 percent) were OA. Looking at the overall citation data and citation data for OA articles, articles published in OA journals have a higher average citation, 29.34, compared to the average citation of 20.91 for all University of Kentucky articles. That equates to an OACA of 8.43, or a 40 percent increase in citation for OA articles compared to the overall average citation.

Total Articles	OA Articles	Avg. Citations	Avg. OA Citations	OA Citation Difference
12,540	3,073	20.91	29.34	8.43

Table 1: Overall citation data

When the data is broken down by OA modality, gold and hybrid, however, a different story emerges. Table 2 shows that of the 3,073 total OA articles, 2,454 (79.8 percent) were published in gold OA journals and only 619 were hybrid. Despite the higher number of OA articles published in gold OA journals, an OACA does not exist for articles published in these journals. The average citation for articles published in gold OA journals is 20.55 compared to the overall average citation of 20.91. On the other hand, there is a significant OACA for OA articles published in hybrid OA journals. The average citation for articles published in hybrid OA journals is 64.18 compared to 20.55 for gold OA journals and 20.91 for overall average citation. Compared to the overall average citation, gold OA articles get 1.75 percent fewer citations, whereas hybrid OA articles get 207 percent more citations. This data demonstrates the importance of incorporating OA modality in any analysis of citation data, particularly when looking at whether an OACA exists.

Total OA	Gold OA	Hybrid OA	Avg. OA Citations	Avg. Gold OA Citations	Avg. Hybrid OA Citations
3,073	2,454	619	29.34	20.55	64.18

Table 2: Citation data by OA modality

University of Kentucky Colleges

The University of Kentucky is comprised of eighteen academic colleges (Agriculture, Food, and Environment; Arts and Sciences; Business and Economics; Communication and Information; Dentistry; Design; Education; Engineering; Fine Arts; Health Sciences; Honors; Law; Libraries; Medicine; Nursing; Pharmacy; Public Health; and Social Work). Of these colleges, most journal article research outputs are from four colleges (figure 1). These four colleges account for 72.5 percent, or 8,683 articles, of the total journal article research outputs, with Medicine accounting for the largest portion at 28.2 percent (3,381 articles),

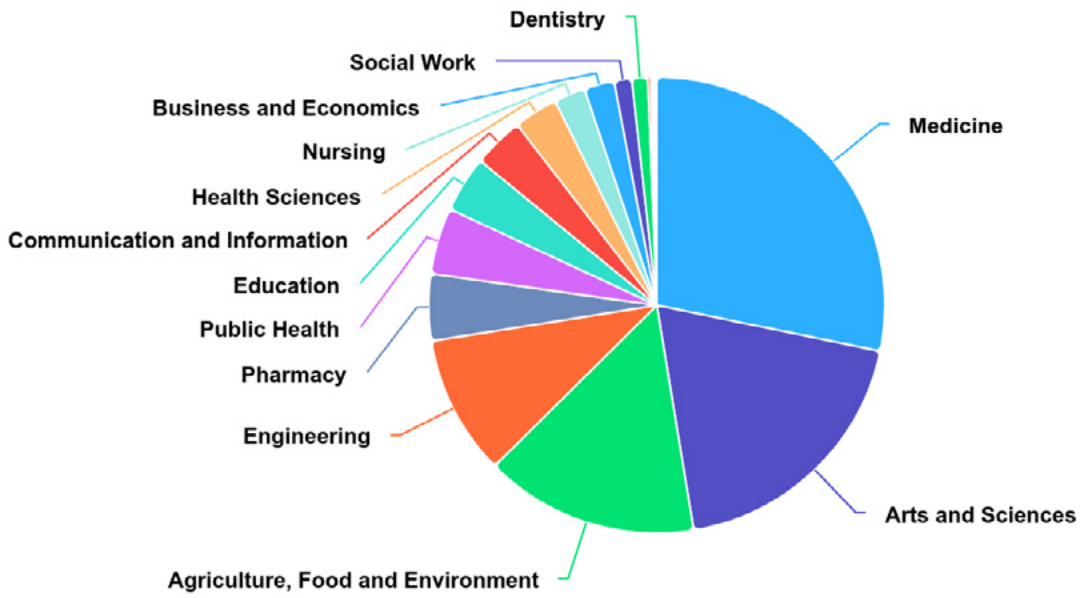

Figure 1: Articles by College

followed by Arts and Sciences at 19.2 percent (2,298 articles), Agriculture, Food and Environment at 15.2 percent (1,816 articles), and Engineering at 9.9 percent (1,188 articles).

Looking at the citation data by college shows that there is an OACA for twelve of the eighteen colleges (table 3). Although an OACA does exist for a majority of academic colleges, there is a variation in the extent to which it exists. For example, the OACA for Engineering (0.44) and Pharmacy (0.48) are negligible. On the other hand, there is a significant difference for Public Health, where the OACA is 80.35. The citation data for the four colleges (Medicine; Arts and Sciences; Agriculture, Food and Environment; and Engineering) that account for a majority of the journal article research outputs, and also account for 77.6 percent of OA articles, show that the OACA ranges from a 2.3 percent increase (Engineering) to a 44.4 percent increase (Arts and Sciences). For all colleges with an OACA, the range is 2.3 percent (Engineering) to 142.2 percent (Public Health).

College	Total Articles	OA Articles	Avg. Citations	Avg. OA Citations	OA Citation Difference
Medicine	3,381	1,032	24.28	27.99	3.71
Arts and Sciences	2,298	495	16.85	24.33	7.48
Agriculture, Food and Environment	1,816	641	18.23	20.35	2.12
Engineering	1,188	217	19.4	19.84	0.44
Pharmacy	565	147	15.13	15.61	0.48
Public Health	564	171	56.51	136.87	80.35
Communication and Information	431	38	27.52	31.37	3.85
Health Sciences	374	56	13.37	18.14	4.77
Business and Economics	255	16	23.17	33.19	10.02
Social Work	149	11	15.26	18.27	3.01
Law	12	1	4.5	10	5.5
Honors	9	3	7.11	9.67	2.56

Table 3: Colleges where an OACA exist

For the colleges where an OACA does not exist (table 4), there are some interesting variations. For example, although an OACA does not exist for Education, the citation difference between non-OA and OA articles is relatively the same, with the average citation barely higher, 0.04, than the average OA citation. There are two colleges, Fine Arts and Design, where there were no OA citations. No journal articles were published OA in Fine Arts during the period under review, and only two articles were published in Design. Research outputs in these colleges, particularly in fields like the Fine Arts, are often produced in nontraditional formats, such as performances, exhibitions, or creative works, rather

than journal articles. As a result, OA article publishing is less prevalent in these disciplines, contributing to the lower OACA observed in these colleges.

College	Total Articles	OA Articles	Avg. Citations	Avg. OA Citations	Avg. Citation Difference
Education	479	59	12.87	12.83	0.04
Nursing	266	40	11.01	8.98	2.03
Dentistry	136	24	7.37	5.29	2.08
Fine Arts	25	0	6.4	0	6.4
Libraries	17	7	1.82	1	0.82
Design	12	2	2.5	0	2.5

Table 4: Colleges where an OACA does not exist

Colleges where an OACA exists have a larger portion of the journal articles' research outputs published as OA (25.6 percent or 2,828 articles) compared to the colleges where an OACA does not exist (14.1 percent or 132 articles). This finding suggests that a higher rate of OA publishing could result in an increase in citations.

University of Kentucky Department

Although the citation data for a majority of the academic colleges, twelve of eighteen, demonstrate that an OACA exists, there is more variance when looking at the citation by departments. For example, citation data for two of the colleges with the highest research outputs and a clear overall OACA, Medicine and Agriculture, Food, and Environment, demonstrate that in roughly 50 percent of the departments, an OACA does not exist. To demonstrate this difference, tables 5 and 6 show a selection of ten departments from each college, where five departments have an OACA, and five departments do not have an OACA. For the College of Medicine, although the college overall has an OACA, the department with the highest research output, Internal Medicine, does not have an OACA. The citation data for Internal Medicine shows an average of 9.13 fewer (31.4 percent) OA citations than the overall average citation (table 5). For the selection of departments within the College of Medicine (table 5) where an OACA exists, the OA citation difference ranges from 1.02 (10 percent) for Orthopedic Surgery and Sports Medicine to 56.16 (90.7 percent) for Physiology. For the departments where an OACA does not exist, the average citation difference ranges from 1.42 (10.7 percent) for Behavioral Science to 26.18 (44.9 percent) for the Sanders-Brown Center on Aging.

Like the College of Medicine, the department in the College of Agriculture, Food, and Environment with the highest research output, Plant and Soil Sciences, does not have an OACA, although the difference here is negligible, with an average citation difference of just 0.3. For the selection of departments within the College of Agriculture, Food, and Environment (table 6) where an OACA does exist, the OA citation difference ranges from 1.53 (11.6 percent) for Veterinary Science to 13.81 (63.8 percent) for Plant

Department	Total Articles	OA Articles	Avg. Citations	Avg. OA Citations	OA Citation Difference
Internal Medicine	599	214	29.12	19.99	-9.13
Surgery	248	35	13.39	15.4	2.01
Behavioral Science	182	32	13.26	11.84	-1.42
Markey Cancer Center	179	70	31.22	26.8	-4.42
Pediatrics	163	40	14.74	19.1	4.36
Physiology	160	69	61.94	118.1	56.16
Neurology	146	58	30.45	43.17	12.73
Orthopedic Surgery and Sports Medicine	145	28	10.23	11.25	1.02
Radiology	123	32	12.53	9.09	-3.44
Sanders-Brown Center on Aging	109	55	58.33	32.15	-26.18

Table 5: Selection of Departments from the College of Medicine

Pathology. For the departments where an OACA does not exist, the average citation difference ranges from 0.04 (0.2 percent) for Biosystems and Agricultural Engineering to 13.63 (47.6 percent) for Retail Tourism and Management, although it should be noted that there is only one OA article published by this department.

Department	Total Articles	OA Articles	Avg. Citations	Avg. OA Citations	OA Citation Difference
Plant and Soil Sciences	350	127	21.55	21.25	-0.3
Entomology	307	131	21.3	26.97	5.67
Veterinary Science	267	98	13.29	14.83	1.53
Animal and Food Sciences	214	75	20.26	13.93	-6.33
Forestry and Natural Resources	122	44	19.58	22.73	3.15
Plant Pathology	120	38	21.64	35.45	13.81
Biosystems and Agricultural Engineering	110	25	17.32	17.28	-0.04
Agricultural Economics	76	20	10.87	16.9	6.03
Horticulture	69	40	17.88	14.3	-3.58
Retailing and Tourism Management	16	1	28.63	15	-13.63

Table 6: Selection of Departments from the College of Agriculture, Food and Environment

Grant Funding

In 2023, the University of Kentucky received $479.3 million in grant funding to support research and creative activity, with more than 52.7%, $252.6 million, coming from federal agencies.[29] The top ten funding agencies (figure 2) were the National Institutes of Health, National Science Foundation, US Department of Agriculture, National Cancer Institute, National Natural Science Foundation of China, National Center for Advancing Translational Sciences, US Department of Energy, National Institute of Drug Abuse, National Institute of Food and Agriculture, and National Heart, Lung, and Blood Institute. Of all the research outputs for the University of Kentucky from 2018 to 2021, grant-funded research outputs account for 66.3 percent, or 8,317 articles, of the total.

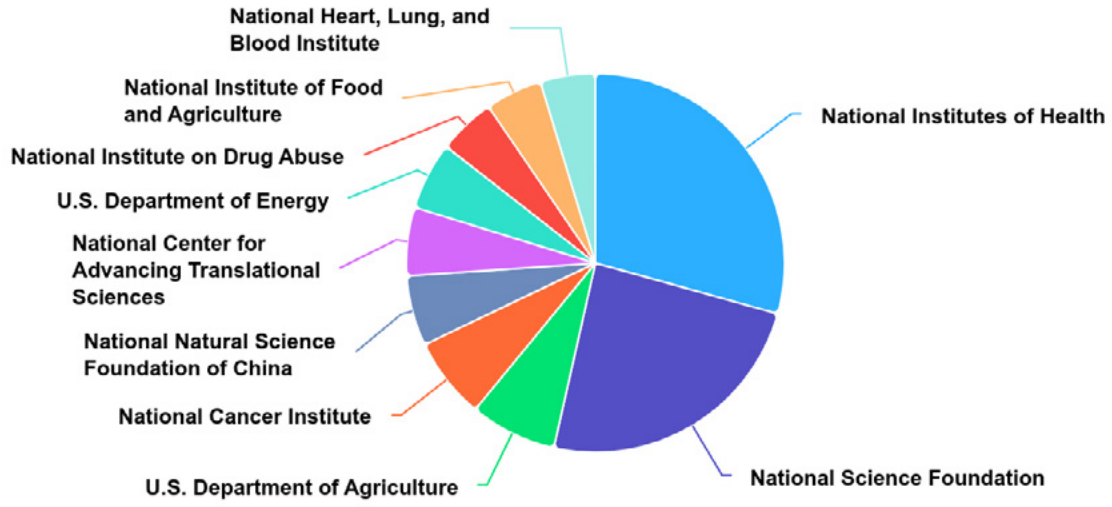

Figure 2: Top Funders

Of the 8,317 journal articles published as a result of grant funding, 2,337 articles, 28 percent, are OA (table 7). Although grant-funded OA articles only account for 28 percent of the total grant-funded journal article research outputs, they account for 76 percent of all OA articles (2,337 of 3,073) published by the University of Kentucky–affiliated authors. Grant-funded journal articles have a higher average citation rate, 24.75, compared to the overall average citation of 20.91 for all University of Kentucky journal articles, a difference of 3.84 (18.3 percent). OA citations follow the same trend, with grant-funded OA journal articles receiving an average citation of 34.32 compared to the overall OA average citation of 29.34, a difference of 4.98 (16.9 percent). Looking at the overall citation data for grant-funded journal articles, there is a distinct OACA, with OA articles receiving 9.57 (38.6 percent) more citations than the average overall citation (table 7).

Grant Funded Articles	Grant Funded OA Articles	Avg. Grant Funded Citations	Avg. Grant Funded OA Citations	OA Citation Difference
8,317	2,337	24.75	34.32	9.57

Table 7: Grant funded citation data

The data indicates a distinct OACA for grant-funded articles, with significant differences in average citations based on the OA modality—gold or hybrid. Of the 2,337 OA articles, 1,829 (78.2 percent) are gold OA and 508 (21.8 percent) are hybrid OA (table 8).

For gold OA articles, an OACA does not exist. On average, grant-funded gold OA articles receive 23.23 citations, which is 1.52 citations (6.5 percent) less than the overall average of 24.75 citations for grant-funded articles. In contrast, hybrid OA articles show a significant OACA. On average, grant-funded hybrid OA articles receive 74.26 citations, which is 51.03 citations (219.7 percent) more than gold OA articles and 49.51 citations (200 percent) more than the overall average for grant-funded articles.

Grant Funded OA	Grant Funded Gold OA	Grant Funded Hybrid OA	Avg. Grant Funded OA Citations	Avg. Grant Funded Gold OA Citations	Avg. Grant Funded Hybrid OA Citations
2,337	1,829	508	34.32	23.23	74.26

Table 8: Grant funded citation data by OA modality

Overall, a majority of the University of Kentucky OA articles are a direct result of grant funding. Grant-funded gold OA articles account for 74.5 percent of all OA articles, and grant-funded hybrid OA articles account for 82 percent of all OA articles. Therefore, the data from grant-funded journal article research outputs further illustrates the importance of OA modality in any analysis of citation data, particularly when looking at whether an OACA exists. This data has shown that gold OA articles have a lower citation rate compared to the overall average citation rate, and hybrid OA articles have a significantly higher citation rate than the overall average citation rate.

Publisher

Many publishers tout the citation advantage of OA publishing, particularly as OA is becoming central to publishers' strategy and more libraries and institutions are entering into OA agreements. Between 2018 and 2021, the University of Kentucky–affiliated authors published the most journal articles, excluding exclusively OA publishers, with Elsevier, Springer Nature, Wiley, Taylor & Francis (T&F), Sage, Lippincott Williams & Wilkins, Oxford University Press, American Chemical Society, IEEE, and the American Physical Society. These publishers account for 67 percent (8,395) of the published journal articles by the University of Kentucky–affiliated authors. Of these top ten publishers, eight have an OACA (table 9). The exceptions are Lippincott Williams & Wilkins and IEEE. For the publisher where an OACA exists the OA citation difference ranges from 2.71 (20 percent) for Sage to 30.95 (137 percent) for Wiley. For the publishers where an OACA does not exist, OA articles receive 2.77 (14.5 percent) fewer citations for Lippincott Williams & Wilkins and 7.88 (18.1 percent) fewer citations for IEEE.

Regarding OA, these publishers account for 48 percent (1,487) of OA articles published by University of Kentucky–affiliated authors. Although eight of ten publishers show an OACA, differences emerge when considering the OA modality. For instance, citation data from seven of the ten publishers (Elsevier, Sage, Lippincott Williams & Wilkins, Oxford University Press, American Chemical Society, IEEE,

Publisher	Total Articles	OA Articles	Avg. Citations	Avg. OA Citations
Elsevier	2,659	357	20.8	26.62
Springer Nature	1,489	580	26.54	30.46
Wiley	1,236	199	22.59	53.54
Taylor & Francis	756	32	9.51	15.78
Sage	700	78	13.58	16.29
Lippincott Williams & Wilkins	474	32	19.05	16.28
Oxford University Press	398	96	20.73	29.63
American Chemical Society	298	10	23.05	26.1
IEEE	209	34	43.59	35.71
American Physical Society	176	69	33.49	47.04

Table 9: Citation data by Publisher

and American Physical Society) indicate that the average citation for gold OA articles is lower than the overall average citation (table 10). Additionally, in seven of the ten publishers (excluding Wiley, Lippincott Williams & Wilkins, and IEEE), the average citation rate for gold OA articles is even lower than the overall average OA citation rate.

Conversely, hybrid OA articles from these publishers, except for Lippincott Williams & Wilkins and IEEE, have higher average citation rates than the overall average citation rate. Furthermore, the average

Publisher	OA Articles	Gold OA	Hybrid OA	Avg. OA Citations	Avg. Gold OA Citations	Avg. Hybrid OA Citations
Elsevier	357	220	137	26.62	14.7	45.75
Springer Nature	580	509	71	30.46	28.49	44.61
Wiley	199	143	56	53.54	62.36	31
Taylor and Francis	32	19	13	15.78	13.16	19.62
Sage	78	62	16	16.29	13.53	27
Lippincott Williams & Wilkins	32	17	15	16.28	18.88	13.33
Oxford University Press	96	58	38	29.63	18.74	46.24
American Chemical Society	10	3	7	26.1	10.67	32.71
IEEE	34	29	5	35.71	37.31	26.4
American Physical Society	69	9	60	47.04	19.78	51.13

Table 10: Publisher citation data by OA modality

citation rate for hybrid OA articles is higher than the overall average OA citation rate in seven of the ten publishers (excluding Wiley, Lippincott Williams & Wilkins, and IEEE).

Despite the clear citation advantage for hybrid OA, gold OA is the preferred OA publishing modality for University of Kentucky–affiliated authors, accounting for 1,069 OA articles (72 percent), whereas hybrid OA accounts for 418 OA articles (28 percent).

The citation data by publisher is consistent with the overall citation data and citation data for grant-funded journal articles in that the driver of whether an OACA exists appears to be the OA modality through which the article is published. The data has consistently shown that gold OA articles have lower citation rates than the overall average citation rates, whereas hybrid OA articles have significantly higher citation rates compared to both the overall average citation rates and gold OA citation rates. To the authors, this OACA advantage by modality for publishers suggests a reluctance on the part of some publishers to "flip" higher-impact journals to a gold OA model. Instead, they facilitate the OA participation of high-status journals through the hybrid model, which preserves the importance of subscription while also collecting on APCs to publish within these journals. Therefore, it is essential that any analysis of OACA include OA modality to accurately capture the extent to which an OACA exists or not.

Discussion

The data provided by the University of Kentucky aligns squarely with numerous studies showing that OACA is no monolith, but rather is highly dependent on the academic discipline of the authors, the OA modality of the published article, the journal in which the article is published, and whether the research was grant-funded. When considering the importance of OACA to faculty, it is crucial to understand the motivations for paying an APC to make an article OA. The University of Kentucky data shows that 24 percent of OA articles were not supported by funding, indicating that University of Kentucky authors chose to pay an APC for reasons other than a possible funder mandate or direct funding to support the APC. Although some authors may have received an APC waiver from the publisher, and with University of Kentucky Libraries having signed TAs with only the Association of Computing Machinery, Cambridge University Press, Company of Biologists, and Royal Society of Chemistry, the majority likely paid the APC from personal, institutional, or other funds.[30] In doing so, this set of authors was motivated by something outside of a funder's mandate to make an article OA. Possible motivations include a belief in the altruism of OA and the importance of equitable access to all scholarly output.[31] They may also believe in the benefits of OACA or that their discipline or department values OA publications in a way that is beneficial to their promotion and tenure cases.[32] It could also be a combination of all of these and other factors.

As seen in the University of Kentucky data, funded articles were 62 percent more likely to be OA than non-funded ones and 135 percent more likely to opt for hybrid OA than non-funded OA articles. These two confounding variables also created the greatest OACA when comparing funded hybrid OA to non-funded gold OA. Because hybrid OA supports author's choice of publication venue, and many authors prefer higher-profile, higher-impact journals that support hybrid OA publishing, it is not surprising that

funded research, with its potential to cover the burden of an APC, results in more hybrid OA articles. Pursuing a hybrid OA publication also aligns with three important priorities and motivations for authors:

1. Publish in the highest-profile journals to broadly disseminate research to area experts, leading to more impactful and cited work
2. Publish in the highest-profile journals to potentially meet the promotion and tenure demands of their department, discipline, and profession
3. Meet funders' OA mandates and magnify the reach of funded research

The role of funding and the potential use of that funding to cover the cost of an APC seems to play an important role in the current APC era of OA publishing. If more funders decide to adopt hardline stances against using funding dollars to pay APCs,[33] then some publishers stand to lose a significant portion of their APC revenue.

The University of Kentucky also sees this data as applicable to how it evaluates read and publish and transformative agreements that potentially provide an outlet for University of Kentucky corresponding authors to publish OA without an APC cost, or more accurately, with the APC covered by the library's agreement. These deals with the big five publishers (Elsevier, Springer Nature, Wiley, T&F, and Sage) vary widely and may include both gold OA and hybrid OA—though more commonly, only hybrid OA. For research-intensive universities such as the University of Kentucky, they typically come with publishing caps or a limited number of articles per year to be covered by the deal. As seen at the University of Kentucky, gold OA is the dominant OA modality (80 percent published as gold OA). Any TA with one of the big five publishers that excludes gold OA would exclude the vast majority of University of Kentucky OA articles with those publishers (Springer 87 percent gold, Sage 79 percent gold, Wiley 72 percent gold, Elsevier 62 percent gold, and T&F 59 percent gold) and effectively exclude articles that were less likely to have funding, not have the APC covered by funding, and require the author to use some other means to pay the APC to make the article OA, therefore providing considerably less benefit to University of Kentucky authors. The data on publisher OACA by journal modality also indicates that some publishers (Wiley and Springer) have shifted higher impact content to the gold model. Therefore, any read and publish deals that exclude gold OA could potentially be excluding major and pivotal publications within certain disciplines. More research on the impact factors of the gold and hybrid publisher portfolios, alongside OACA, is needed to draw more concrete conclusions.

Not to be lost in this conversation about TAs is the value of green OA and the role it can play in how libraries discuss OA publishing decisions with faculty. As can be seen with the University of Kentucky data and data from previous studies, green OA can also play a valuable role in meeting funder mandates, increasing OACA, and aligning with faculty priorities and motivations for OA, all without the cost or burden of an APC. Like most institutions, University of Kentucky has a low rate of self-archiving of published articles into UKnowledge, its institutional repository. Research has shown that institutional authors are reluctant to pursue green OA due to concerns about the archiving process and

the user experience of archiving in institutional repositories, unfamiliarity with author rights regarding archiving, doubts about copyright compliance, the potential role of green OA in the scholarly landscape, and their lack of time to investigate all of these aspects of self-archiving.[34] What is needed is a new model for green OA that meets the demands of both faculty and institutions. Green OA provides all of the same benefits as hybrid OA but without the APC. As we approach the potential implementation of the OSTP (Office of Science and Technology Planning) memo, its OA mandate, and the removal of embargoes, the role and impact of green OA will only be magnified. The University of Kentucky is exploring ways to rethink self-archiving. One possibility is to have the library take on this work; the University of Kentucky is also starting conversations with publishers about potential ways to create a more direct pathway for institutional-repository depositing that could better maximize green OA and make it a sustainable avenue for OA.

If the belief in OACA is at the heart of an author's decision to pay an APC and make an article OA, it is time for libraries to have honest discussions with their institutional authors about the reality of OACA and the true value and cost of OACA to authors. For those authors paying APCs with personal, institutional, or other funding, they should be aware of the return on investment of an APC in terms of OACA. As the University of Kentucky data shows, the ROI for these articles is relatively minimal overall, more advantageous for certain disciplines, and even more advantageous when publishing OA in a hybrid journal. As more and more libraries provide research services to faculty, authors could benefit from a decision tree or OACA workflow to help evaluate how the APC will be paid, whether a mandate needs to be met, and which OA modality (hybrid, gold, or green) could have the greatest OACA impact. This would enable authors to make more informed decisions about whether to pay an APC to make a work OA, consider green OA as a viable option, meet mandates, and choose the OA modality that best supports their priorities and motivations.

Conclusion

The goal of this study was to better understand OACA from a longitudinal set of articles at a major research institution; the confounding variables that correlate with increases, decreases, and null effects on OACA; and how these contribute to a more holistic understanding of OACA and its implications for libraries. Like many institutions and libraries, the University of Kentucky and the authors of this study have actively promoted the absoluteness of OACA to researchers and authors as a way to generate interest in and acceptance of OA. What this study adds to the literature, however, is the understanding that OACA is more nuanced and could be particularly influenced by factors that vary from institution to institution, such as the department of the primary or corresponding author, grant funding awarded to the institution and its researchers, and the publishers and OA modalities authors publish within.

This detailed and longitudinal examination of institutional publishing, OACA, and the confounding variables present in OACA has led the authors to pursue focus group discussions with institution-affiliated authors. These focus groups will explore many of the questions raised by the findings and discussion in this study, including institutional corresponding authors' OA publishing practices, how

APCs are paid, motivations for paying an APC, how often APCs are included in grant budgets, and how the University of Kentucky should locally evaluate and approach TAs. Using this data as a starting point for these conversations should enable the University of Kentucky to have nuanced conversations with its authors about the ROI of OA and discuss future interventions and strategies to help authors maximize the impact of their research, with or without an APC.

CRediT authorship contribution statement

Ben Rawlins: Writing – review & editing, Writing – original draft, Conceptualization, Data Curation, Formal Analysis.

Mitchell Scott: Writing – review & editing, Writing – original draft, Conceptualization, Data Curation, Formal Analysis.

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FEATURE

Known Item Search

Theoretical and Practical Considerations

Birger Hjørland

This article looks at the concept "known item search" (KIS) and considers it in relation to library practices. The author critically examines previous research on KIS and argues that the concept is important because it is categorically different from "subject search" and because it is assumed in processes such as bibliographic verification and descriptive cataloging. The article further discusses which kinds of metadata best serve KIS and argues that the traditional distinction between descriptive cataloging and subject cataloging is a fruitful point of departure for describing the metadata needed for respectively KIS and subject searches.

Introduction

Known item search (KIS), the search for a particular thing or document, is a common activity performed in library catalogs, in bibliographies, databases, and search engines, as well as in everyday life (e.g., finding a song in which just a fragment is remembered).[1] It is a concept that seems easy to understand, and it is often regarded as a rather trivial problem in library and information science (LIS), where the main focus has been subject searching (also termed "topic searching").[2]

Because KIS puts other demands on both search systems (including document descriptions) and on search strategies, however, it is an important concept in its own right. Min-Yen Kan and Danny C. C. Poo wrote:

> "How important is known item search? In the setting of an OPAC [online public access catalog], it is very important. Larson [3] points at the long term decline of subject searching in OPACs, in which known item search accounts for a growing proportion of library catalog searches, up to 50%. However, supporting these types of searches has largely been ignored by the information retrieval community, whose focus has been on topical search (e.g., TREC bakeoff competitions [4]). While these efforts have improved the state of the art for topical search, we see a need to support better known item query detection and retrieval."[5]

This quote is not meant to claim that KIS is more important than subject searches but rather to illustrate that KIS is important enough to deserve special attention in LIS.

In library science, the purposes of library catalogs have been discussed since Charles A. Cutter, who in 1876 presented the following "objects":[6]

1. To enable a person to find a book of which either:
   (a) the author is known
   (b) the title is known
   (c) the subject is known

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2. To show what the library has:
    (d) by a given author
    (e) on a given subject
    (f) in a given kind of literature
3. To assist in the choice of a book:
    (g) as to its edition (bibliographically)
    (h) as to its character (literary or topical)

The first of Cutter's objectives is about enabling KIS, while 2 (e) is about subject searching. Jin Ha Lee, Allen Renear, and Linda C. Smith discussed these rules from the perspective of KIS, writing:

> In the 1876 edition of Cutter's Rules for a Printed Dictionary Catalogue (p.10), we find that the first objective of a catalog is "1. To enable a person to find a book of which either (A) the author, (B) the title, (C) the subject is known." It is interesting that an interpretation of this allows subject as an access point for known-item search. However in the later literature, "title" and "author" dominate as the major attributes used for conducting a known-item search, and the mention of "subject" as an access point becomes harder to find. In some cases, known-item searches are even considered to be equal to the aggregation of "title" and "author" searches (Cooper & Chen, 2001).[7] However, a few authors do consider other attributes such as publisher (Swanson, 1972;[8] Hjørland, 1997),[9] series (Hjørland, 1997), subject (Wildemuth & O'Neill, 1995)[10] as the types of information used for known-item searches.[11]

In spite of Cutter's explicit mention of subject searches, library and information scientist Pauline A. Cochrane described what she considered a paradigm shift in library science:

> "Common wisdom since Cutter's time has been that most users of the library want a catalog where they can find a particular item, a known item."[12]

Although this example may misinterpret Cutter, it is reflective of a tendency in library cataloging theory and practice to prioritize descriptive cataloging. The opposite tends to be practiced in scientific subject databases such as Chemical Abstracts, MEDLINE, PsycINFO, and Web of Science, which tend to have inferior descriptive data—for example, to have less author authority data, or, as with the Web of Science, not to provide original titles for non-English articles. Such descriptive elements are better developed in library cataloging, but, as argued by Birger Hjørland, this represents a problematic tendency in library cataloging practice to prioritize KIS, confirming Cochrane's view.[13]

The priorities between KIS and subject searching have therefore not been uniform in LIS, and different kinds of searches have not always been clearly distinguished in objectives for document representation. Important research has been carried out in relation to KIS, and the main purpose of this article is to address the main conceptual and theoretical issues of this topic.

Definitions and Meaning of "KIS"

Lee, Renear, and Smith found it surprising that despite its central status in LIS over a long period, the concept "KIS" has received practically no systematic discussion.[14] The authors further demonstrated "that this apparently simple notion is actually quite complex and varied, and moreover, that there is hardly a single feature ordinarily associated with it that can confidently be said to be an essential part of the concept." The article pointed out that it is not required that the searcher "know" the searched document to exist or that it really exists, because a bibliographical reference can be to a nonexistent document (a so-called "bibliographical ghost"). A famous example of such a "ghost" is a highly cited, non-existing paper by information scientist Gerald Salton, which he never wrote.[15] The term "known item" has therefore misleading associations. A person may be searching for a document, on which very little is remembered or known with a reasonable degree of certainty, and which may even have a doubtful existence. Therefore, when information scientist Michael Buckland wrote, "Known items generally have names, addresses, or distinguishing physical features," this is only true when the searcher knows some of these characteristics.[16] There are easy as well as difficult cases of KISs, and in the difficult cases, such characteristics may be unknown.

Dictionary for Library and Information Science defined:

> "[K]nown-item search: A search in a library for a specific work, as opposed to a search for any work by a known author or for works on a particular subject."[17]

ISO 5127 defined:

> "[K]nown item retrieval: *search and retrieval* (3.10.2.01) for a specific item present in the searcher's mind from the start on" [18]

Buckland suggested:

> "Known item search is ordinarily understood to mean a search where the searcher has a specific item in mind and either has an address for it or else believes (or hopes) that sufficient clues, such as author surname and/or title words, will enable that particular document to be found. It is, in effect, a citation search with, commonly, an incomplete or uncertain citation."[19]

Buckland also wrote that the opposite of "known item search" is a "not-known item search," writing:

> Known item search is traditionally distinguished from subject search. Strictly, this is an incomplete view because the logical complement of a known item search has to be a not-known item search.[20] Subject search is a common kind of not-known item search in a library context, but it is not the only kind. The many other possibilities include, for example, searches by genre, bestsellers, and banned books.[21]

In a library or other bibliographic context known item searches are often not, in fact, for a particular known item but, more loosely, for any instance of a particular known edition or of an instance of

any edition of a particular known title. This is a departure from the pure case of search for a unique, particular document.[22]

In his article, Buckland elaborated on the distinction between "particulars" and "specimens." A particular document may be an exemplar (i.e., an individual copy) of a book with notes or marked passages, whereas a specimen may be any copy of a given edition of a book.[23] Normally just specimens are meant in relation to KIS, but in some instances, the user may want a particular, unique document. In this connection, Lee, Renear, and Smith brought the attention to IFLA's Functional Requirements for Bibliographic Records (FRBR), which later developed to IFLA *Library Reference Model* (LRM),[24] which provides a model describing the relations between "work," "expression," "manifestation," and "item."[25] FRBR/LRM thus enable users to distinguish four kinds of known items. In the example of Shakespeare's *Hamlet*, the known item may mean (1) work: the tragedy by that title written by Shakespeare; (2) Expression: a Danish translation of *Hamlet*; (3) Manifestation: a particular Danish edition of Hamlet; (4) Item: a specific exemplar of a particular Danish edition of Hamlet (in libraries that have multiple copies of the same book, "items" are often given an individual barcode or RFID [radio frequency identification] tag).

What then, is a KIS? We saw above that Buckland suggested it to mean a search where the searcher has a specific item in mind and has either an address or clues expected to be sufficient to find it.[26] If having "a specific item in mind" includes having a bibliographic reference (whether sufficient or insufficient, and whether a ghost or not), then this part of Buckland's definition seems okay. The other part of the definition—"has either an address or clues expected to be sufficient to find it"—excludes searching for something without any idea of whether one's clues are sufficient to find it, which, however, is probably often the case (e.g., when a name is on the "tip of the tongue" [ToT], as with example number 5 below).[27]

Examples and Characteristics of KIS

(1) A researcher looks up a bibliographical reference in an OPAC to order and to obtain a copy of the document referred to. Normally a basic set of essential bibliographic data is considered essential in both bibliographical references and in OPACs—for example, author's last name, publication year, title of book or journal, publisher's name (in the case of books), and volume, first page, and article title (in the case of journal articles) and, when available, the digital object identifier (DOI).[28] Looking up a combination of a few of these essential data will, if the library has or provides access to the document, in the overwhelming number of cases lead to an unproblematic match, and the document can be ordered. Frederic G. Kilgour, for example, prescribes how informed library users can issue effective known item queries by including the author's surname and specific words from the title of the item.[29] Normally, the redundancy in the bibliographical data (both the user's reference and the library's OPAC) is high, meaning that if the first attempt fails, then another combination of such essential data will probably succeed.

(2) If the document is not found as described in point (1), it may be (a) because there are errors in the user's bibliographical data, (b) because there are errors in the library's bibliographical data, (c) because the library does not have the document, or (d) because the reference is a bibliographical ghost.[30]

Normally the best procedure is first to verify the user's data (e.g., by searching in Google, WorldCat, or other more comprehensive bibliographical databases). If verification succeeds, the document can be ordered, or if it is not in the library, an interlibrary loan may be requested. A number of special problems exist, including:

a. A common problem in KIS is spelling errors (in user queries or in databases, e.g., when input is made by optical character recognition) or spelling variations (e.g., "color" and "colour"). Now that search engines support fuzzy searching and approximate string matching, such errors have been reduced in search engines and some databases. Unfortunately, many OPACs have not yet successfully addressed spelling search errors.

b. Another example is due to ambiguities in printing years. Publishers have a tendency to provide the wrong publication date for their book (e.g., books published in the fall are given the following year's publication date).[31]

(3) In some cases, the user's reference is very problematic. This author got the following reference from ChatGPT-4o and has not been able to verify it: "Sayre, Kenneth M. 'Cybernetics and the Philosophy of Mind: The Neglected MacKay-McCulloch Exchange.' *Kybernetes*, vol. 38, no. 9, 2009, pp. 1539-1555." The journal *Kybernetes* exists, the vol. issue and year match each other in the existing journal, but the article is not on the specified pages. There exists a book by Sayre, *Cybernetics and the Philosophy of Mind*, but without the subtitle and not containing the demanded information about MacKey. Google searches of both "The Neglected MacKay-McCulloch Exchange" and "MacKay-McCulloch Exchange" returned zero hits. A return to ChatGPT-4o, indicating the error and asking for a correction, provided the same reference, but now in issue 7/8, which is also wrong.

This example shows the user's options in difficult cases: systematically use every bit of information in the given reference (and systematically exclude every other bit of information) in order to verify the reference and try to obtain further information about the sought item.[32] If the reference contains a reasonable amount of bibliographical data, and it cannot be verified, then it must be considered a bibliographical ghost; if it does not contain a reasonable amount of bibliographical data, then it must be considered lost (at the least for now).

(4) KISs are not always initiated by bibliographical references, but also user memory about documents, or about some contents of a document. For example, one may have heard about "the 20 percent rule" (or was it "the 25% rule"?) in library classification and expect it to be part of a library's written guidelines and therefore search for it. Or, one may have a more or less vague memory from prior reading about some information that could be relevant for a present argument and try to recall where this was read and then to retrieve that document. In such cases, the KIS resembles a subject search, in which the remembered information is used as input and search criteria, and there is the possibility that more than one document fulfils the user's need.

(5) The phenomenon known as "tip of the tongue" (ToT) is relevant to many cases of KIS: The searcher cannot remember the relevant term for something but has a partial memory of it and a feeling that it is

likely to be remembered soon. ToT is studied in many fields, particularly in psychology.[33] There are very few studies relating this term to document searches in databases, however, and these seem not clearly to distinguish the general failing to retrieve documents from the cases with the feeling to be *almost* able to remember the term needed to retrieve a document.[34] ToT has also been used to discuss recall of non-textual items (e.g., music).

(6) Some examples are due to library users' lack of knowledge about the library catalog. Catherine M. Dwyer et al. found that more problems were associated with periodical articles than with monographs.[35] For example, many requests were based on article titles when journal titles should be used. This issue is related to the problem that some documents (e.g., *Educational Resources Information Center* documents) are not cataloged in the OPAC, but rather identified in a separate database, even if the library holds them.[36]

Based on a small set of queries, Kan and Poo provided some general characteristics of KISs (as opposed to subject searches):

- They are longer and often copied from a syllabus or a web search.
- They contain determiners: In English titles, determiners (such as "the," "an," and "a") are often parts of book titles and are thus also prevalent in known item queries. In contrast, most area or unknown item searchers do not type determiners into search boxes as many know that such words are often ignored by OPACs.
- They contain proper nouns, including names of authors and editors and names of things that may appear in document titles.
- They contain mixed case—for example, exactly matching a title's orthographic case (whether or not the OPAC is case insensitive).
- They contain certain advanced operators, such as specifying terms for the author and the title fields.
- They contain keywords such as "journal," "course," and "textbook." These usually connote the desired type of resource, rather than a keyword search for the word. Similarly, many titles in libraries but few subject headings consist of these words.[37]

These characteristics of KIS are, as already noted, based on a small sample of requests. However, even if studies are performed on large samples, such characteristics will only be indicative: some KISs may not conform to certain rules or statistical patterns. Nonetheless, they are important because, as suggested by Kan and Poo, they may provide a basis for improved search interfaces that may be helpful for users.

The Functions of the KIS Concept

Bibliographic Verification (or "Bibliographical Validation")

One function of the term "known item search" relates to the concept "bibliographical verification." In libraries, bookstores, and databases, many requests for documents contain errors and therefore cannot easily be found. Bibliographic verification is admittedly easier in the online catalog compared to the

card catalog, but this is just a question of degree, not of a categorical difference. If, for example, the author or title in a search or request is wrong or misspelled, a first conclusion may be that the required document is not in the library. Rather than providing this answer to the users, the library may start a verification process examining the request for errors (or examine if the reference is a "bibliographic ghost"), correcting the errors, and obtaining the document (if not from the library's own stacks, then potentially from an interlibrary loan). Bibliographical verification is the process of confirming the accuracy and completeness of bibliographic information for a given source. This involves checking details of a basic set of essential bibliographic data—such as author name, title, and publication date—and thereby verifying or falsifying the existence of a document about which such data have been given. The staff working with this task in large libraries used to be trained in bibliographical verification (often in relation to interlibrary loan), and a textbook has been written on this (in Danish).[38] The verification process was often an algorithmic procedure based on national bibliographies, catalogs from large libraries such as Library of Congress, and other bibliographical tools. The point here is that such verification processes are KISs and that they are very different from subject searches performed in libraries, such as helping students and researchers find books, articles, and other documents for their theses and papers.

The above is written in the past tense because today libraries no longer tend to perform verification processes in the same formalized ways.[39] This does not make KISs and bibliographical verification needless concepts, however, because it is still important to distinguish them from subject searches in order to optimize both kinds of search processes.

An important implication of this issue of verification is the need for researchers and students to know about essential bibliographic data. These data are required for readers to obtain the documents to which the references refer. This is often done by teaching a specific referencing style or standard, for example, the *Chicago Manual of Style* or the "ANSI/NISO Z39.29-2005 standard.[40] Such styles develop over time. For example, today it is mostly required that references to journal articles include the article's DOI, which has contributed to facilitating KIS (also in OPACs when these are integrated with discovery services that support DOI searching.)

"Descriptive Cataloging" Versus "Subject Cataloging"

The dichotomy between KIS and subject search is related to the dichotomy between descriptive cataloging and subject cataloging. Joan M. Reitz emphasizes the difference between the two last processes in the following definition:

> Descriptive cataloging: The part of the library cataloging process concerned with identifying and describing the physical and bibliographic characteristics of the item, and with determining the name(s) and title(s) to be used as access points in the catalog, but not with the assignment of subject headings and genre/form terms. In the United States, Great Britain, and Canada, descriptive cataloging is governed by Anglo-American Cataloguing Rules (AACR2) [and its successor Resource Description and Access, RDA].[41]

In relation to the part of the library cataloging process concerned with classification and indexing, Reitz defined:

> Subject analysis: Examination of a bibliographic item by a trained subject specialist to determine the most specific subject heading(s) or descriptor(s) that fully describe its content, to serve in the bibliographic record as access points in a subject search of a library catalog, index, abstracting service, or bibliographic database.[42]

One reason for the differentiation between descriptive and subject cataloging is that generalist librarians in major libraries trained in the standards mentioned by Reitz and typically performed the former, while subject specialists typically performed the latter.

Therefore, as reported by Hjørland, large libraries used to have separate departments for descriptive and subject cataloging, staffed with general librarians and subject librarians.[43] A similar separation can also be found in subject bibliographical databases such as MEDLINE, and these two library processes have their parallels in the field of bibliography, where a distinction exists between "descriptive bibliography," which describes documents as physical objects, and "subject bibliography," which compiles and characterizes documents, emphasizing their subject.[44] Descriptive bibliography is primarily based on knowledge about techniques of book production, whereas subject bibliography requires subject knowledge.[45]

It is too simple to say that descriptive cataloging serves KISs while subject cataloging serves subject searches, although overall this is the case. Whereas a subject assignment to a document is generally a bad tool for verification (further described below), many descriptive data are often useful for subject searches (e.g., searches using words from document titles). Nonetheless, KISs and subject searches make different demands regarding the prioritization of metadata, and this implies that KIS is a concept that requires its own aim to be considered in developing bibliographic databases.

Kinds of Metadata Suited for KIS

The author has already presented the concept of essential bibliographical data for KIS in the first of the examples of KIS. The present section focuses on discussing three dichotomies suggested by Michael Buckland for understanding KIS, and it ends with an overall conclusion about metadata suited for KIS.[46]

Terms for "Individual Concepts" Versus "General Concepts"

Buckland discusses the relation between KIS versus subject search on the one hand and individual concepts versus general concepts on the other.[47] Concerning individual concepts, Buckland, citing indexing theorist Robert Fugmann, wrote: "'individual concepts' are persons, institutions, and towns, all with proper names, and which occur in single or very few instances."[48] Buckland seems to suggest that individual concepts somehow correspond to, or are appropriate for, supporting KISs. Before we discuss this, it can be mentioned that individual concepts (e.g., the name of a person), may be indexed by general terms such as "biography,"[49] "anamnesis" (medical history of an individual person), "case

reports," and so forth. These examples demonstrate that general concepts are also developed in order to facilitate communication and retrieval of information about individual concepts considered from different perspectives and interests.

Concerning the use of individual concepts for KISs, Buckland wrote:

> "Fugmann rightly stresses the use of proper names to refer to individual concepts, but proper names may also be used to describe (dispositively). Authors' names are ordinarily associated with known item searches for particular books . . ."[50]

Although it is often true that author names are known when items are sought, this need not be the case, nor is it always the case that other proper names (e.g., journal titles) are known, or any other individual concept for that matter. Many kinds of KIS occurs when authors have a vague memory of a relevant quote they have formerly read and are now trying to retrieve. In such cases, general concepts often are the only available clues.[51]

Referring Versus Describing

Buckland suggested that KIS corresponds to the process of referring, whereas subject search corresponds to the process of describing:

> "The difference between naming what is wanted in a known item search and specifying what is desired in a not-known item search corresponds to the distinction between referring and describing.[52] Referring indicates directly; describing indicates indirectly by specifying characteristics which may in turn indicate appropriate targets. In a traditional digital database one looks up the name of a record of interest in the appropriate table, with possibly a data dictionary to resolve any ambiguity. In a full-text search one searches using descriptors, closely related terms, and vocabulary control which, one hopes, will indicate a small enough set to allow selection of any one or more suitable items without missing other, more suitable items."[53]

Let us exemplify Buckland's claims. In a KIS, author names, journal titles, or specific (combination of) terms may be looked up in order to see if the item searched for can be recognized, possibly after further specifications, and the task thus solved. In a subject search, a combination of terms or other subject access points are looked up to see if the set of items thus retrieved seems relevant and satisfactory in relation to recall and precision.[54] If not, the process continues with modified concepts using so-called "recall devices" and "precision devices" until the task is considered solved. In both cases, what is done is to look up what a certain combination of subject access points are *referring* to. It is difficult to describe information searching as a descriptive process, because the relevant documents are unknown and therefore impossible to describe. It is better to say that the searcher lists a set of terms describing criteria, which the documents must fulfill in order to be relevant.

Kinds of Properties

In KISs versus subject searches, there are no differences in the properties of the documents sought for; in principle, these documents, and therefore their properties, are the same.[55] Differences in properties are not specific to the items sought, but rather in the way the search processes are performed and occasionally in the databases used. In relation to the present article, an important issue to clarify is the nature of the data most relevant for KISs in databases as distinct from those most relevant for subject searches.

Buckland discussed the distinction between material and non-material properties:

> Material properties are the physical attributes, the "brute facts" of a document, such as a title as printed, the author's name as given, and its literal text as well as physical features such as its height, pages, binding, and other objective characteristics. Its non-material properties are any imaginable characteristics other than its material properties, including ownership, topics discussed, point of view, copyright status, genre, and the language of the text.[56]

In this quote, "the author's name as given" is considered a material property of a book, but in table 2 (p. 4), exemplifying the book Bodin's *République* (Paris, 1580), the property that it is authored by Jean Bodin is considered a non-material property. This is somewhat confusing, and here it is suggested instead to distinguish the kinds of data obtained by respectively descriptive and subject cataloging, as described by Reitz above.

- *Data obtained by descriptive cataloging*: The physical and bibliographic characteristics of the item, and the name(s) and title(s) to be used as access points. Other points can be added, such as tables of contents, and, in citation indexes, the reference lists of the documents catalogued.
- *Data obtained by subject analysis*: Assigned classification notations, subject headings, genre/form terms, and notes about the contents.

Although both categories might in some circumstances serve KISs, I shall here argue that data obtained by subject analysis is relatively unhelpful because of the nature of subject analysis. A given subject analysis (and the resulting metadata) represent one individual's view of what the document is about, and we know from inter-indexer consistency studies that inconsistency is an inherent feature of subject indexing, rather than a sporadic anomaly.[57] Whereas there is a fair chance that a person remembers some of a document's physical or bibliographic characteristics, or (parts of) its title or the author's name, the same is not the case with a classification code or a subject heading, which is not a part of the document itself, but is something that somebody has assigned to a bibliographical record. This corresponds to the finding by David W. Lewis: "Searching for known items by subject is very inefficient, but can be successful when other approaches fail."[58]

Our conclusion is that although a basic set of descriptive data (as provided by recognized reference style guides) is often fully adequate, there may be difficult cases for which a broader set of descriptive data are needed, even including subject metadata. We can say, through a modification of a quote by Buckland, "We conclude that we are unable to say confidently of any bibliographical data that

it could not be relevant for KIS."[59] This does not mean, however, that it is impossible to prioritize bibliographical metadata for KIS.

Kinds of Metadata Best Suited for KIS

We have seen that Kilgour prescribed how informed library users can issue effective known item queries by including the author's surname and specific words from the title of the item. Such a simple procedure resolves very large parts of identifying KIS, but not all. We have also considered how scholarly norms of bibliographical referencing—for example, the *Chicago Manual of Style*—prescribe essential sets of metadata, which are meant to guarantee findability of the documents referred to, and we have seen that such norms develop over time and today include the DOI for journal articles. This may be considered the essential knowledge about metadata for KIS. Still, however, there are difficult problems that cannot be solved by such essential sets of metadata. We may fear that these problems will increase because of problems with hallucinations in systems like ChatGPT, as have been exemplified above.

Although we have concluded above "that we are unable to say confidently of any bibliographical data that it could not be relevant for KIS," we have also claimed that this does not mean that it is impossible to prioritize bibliographical metadata for KIS. This becomes, however, much more difficult beyond what is considered the essential set prescribed by referencing norms. It has been argued above that, contrary to Buckland's suggestions, the dichotomies between "individual/general concepts," "referring/describing," and "material/non-material" properties may not be important. The further development of metadata for this purpose may be based on studies of different kinds of documents in a way related to the ways in which documents are studied in the field of descriptive bibliography.[60]

Conclusion

KIS is generally considered the easiest and the most successful kind of document searching in OPACs. Debra J. Slone, for example, wrote that query formulations for KIS seems a natural state for searchers and that 88 percent of searchers were successful.[61] KIS is, however, also a very frequently used kind of search, and some databases, such as WorldCat, are primarily used for KISs.[62] We have claimed that library cataloging—in contrast to scientific bibliographical databases—have prioritized KIS higher than subject searches. However, KIS often encounters greater problems when performed on the web.[63]

Which strategies can be used by the library community to improve KIS?

One point is to reconsider the metadata in library catalogs. Seymour Lubetzky provided the important principle of functional library cataloging in which the purposes, functions, and values of the different kinds of metadata need to be carefully explored.[64] There is a need for updated investigations and considerations for cataloging of all kinds of information resources. More obviously, there is a need to provide techniques such as fuzzy spelling/spell-check techniques, already common in search engines.[65] It seems obvious to focus such efforts on databases such as WorldCat, which are mostly intended and used for KIS.

Kan and Poo provided a set of characteristics that distinguish KIS from subject searches.[66] Based on such characteristics, machine learning, language modeling, and machine translation evaluation techniques were used to automatically identify KIS among other online enquiries. The authors found that this approach has the potential to streamline the interfaces of both OPACs and digital libraries in support of KIS. This too seems to be a way forward.

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10. Barbara M. Wildemuth and Ann L. O'Neill, "The 'Known' in Known-Item Searches: Empirical Support for User-Centered Design," *College and Research Libraries* 56, no. 3 (1995): 265–81, https://doi.org/10.5860/crl_56_03_265.
11. Jin Ha Lee, Allen Renear, and Linda C. Smith, "Known-Item Search: Variations on a Concept," *Proceedings of the American Society for Information Science and Technology* 43, no.1 (2007): 1–17, http://dx.doi.org/10.1002/meet.14504301126.
12. Pauline A. Cochrane, "A Paradigm Shift in Library Science" (guest editorial), *Information Technology and Libraries* 2, no. 1 (1983): 3–4.
13. Birger Hjørland, "Description: Its Meaning, Epistemology, and Use with Emphasis on Information Science," *Journal of the Association for Information Science and Technology* 74, no. 13 (2023): 1532–49, https://doi.org/10.1002/asi.24834.
14. Lee, Renear, and Smith, "Known-Item Search: Variations on a Concept," 1.
15. "Bibliographic ghosts" (or "phantoms") are references that refer to non-existing documents. About the example by Salton (1975) mentioned in the text, see Davin Dubin, "The Most Influential Paper Gerard Salton Never Wrote," *Library Trends* 52, no. 4 (2004): 748–64.) The extremely hyped generative AI system ChatGPT-4o provides many bibliographical ghosts and other kinds of what are often called "hallucinations," but should rather be called "fabrications" and "falsifications" (cf., Robin Emsley, "ChatGPT: These Are Not Hallucinations – They're Fabrications and Falsifications," *Schizophrenia* 9, 52 (2023), https://doi.org/10.1038/s41537-023-00379-4).
16. Michael Buckland, "Known Item Search and Subject Search," *Library Resources & Technical Services* 68, no. 3 (2024): 1–9, quote p. 4, https://doi.org/10.5860/lrts.68n3.8132.
17. Joan M. Reitz, *Dictionary for Library and Information Science* (Libraries Unlimited, Western Connecticut State University, 2004; Digital edition: *ODLIS. Online Dictionary for Library and Information Science*, http://www.abc-clio.com/ODLIS/odlis%5Fa.aspx). Entry "known-item search." Reitz's "definition" continues by including advice on how to perform KIS.
18. ISO 5127: 2017(E), *Information and Documentation: Foundation and Vocabulary*, 2nd ed. (International Organization for Standardization).
19. Buckland, "Known Item Search and Subject Search." (Already Michael Buckland, "On types of Search and the Allocation of Library Resources," *Journal of the American Society for Information Science* 30, no. 3 (1979), 143–47, https://doi.org/10.1002/asi.4630300305, criticized the dichotomy between KIS and subject searches. On p. 145 he wrote "In other words a 'known item' search may, in fact, be an indirect and disguised 'subject' search for specific information not necessarily unique to the document used.")
20. Buckland here has an endnote 3: "For example, Michael Buckland, *Information and Information Systems* (New York: Greenwood, 1991), 105 no. 3; Birger Hjørland, *Information Seeking and Subject Representation* (Westport, CT: Greenwood [1997]), 14, 20."
21. Buckland has here an endnote 4: "Keyword searching is commonly used in subject searches, but not always, and keyword searches are not always subject searches. So the distinction in process between keyword search and other forms of search is different from the distinction in purpose between known item search and subject search and its examination would require a different paper."

22. Other categories of search include "fact retrieval," the search for specific information rather than for documents containing this information, and "area search [which] is one in which a person uses the on-line system to identify the area of the library where a group of subject or author related books are located," cf., Debra J. Slone, "Encounters with the OPAC: On-Line Searching in Public Libraries," *Journal of the American Society for Information Science* 51, no 8 (2000): 757–73 (quote p. 762), https://doi.org/10.1002/(SICI)1097-4571(2000)51:8%3C757::AID-ASI80%3E3.0.CO;2-T.

23. *Oxford English Dictionary* provides, among others, the following definition of the noun specimen: "4.a. A single thing selected or regarded as typical of its class; a part or piece of something taken as representative of the whole." (In this article, "specimen" is used, for example, on a single copy of a book representing all books published in the same edition of that book.) In relation to Buckland's distinction between particular document and specimens, different kinds of metadata are required for each of these categories. Individual documents are not normally considered in library services, but in special cases, such as rare book collections, detailed descriptions as known from the field of descriptive bibliography are needed. For an introduction to the different fields of bibliography, including descriptive bibliography, see Birger Hjørland, "Bibliographical Foundations of Information Science: A Review Essay," *Journal of Documentation* 81, no. 1: 128–46, https://doi.org/10.1108/JD-06-2024-0126. Concerning the description of individual copies of books, see Marcia Reed, "Provenance of Rare Books," in *Encyclopedia of Library and Information Sciences*, 4th ed., ed. John D. McDonald and Michael Levine-Clark (CRC Press, 2017), 3766–773.

24. See, for example, Maja Žumer, "IFLA Library Reference Model (IFLA LRM): Harmonisation of the FRBR Family," *Knowledge Organization* 45, no. 4 (2018): 310–18, https://www.nomos-elibrary.de/10.5771/0943-7444-2018-4-310.

25. Lee, Renear, and Smith, "Known-Item Search: Variations on a Concept," 9.

26. Buckland, "Known Item Search," 7.

27. Lee, Renear, and Smith, "Known-Item Search: Variations on a Concept," p. 3 made a distinction between operational and conceptual definitions of a KIS, where operational definitions confuses the conceptual issue with the issue about how to perform KIS.

28. ISBN, on the other hand, is not normally considered an essential element in reference styles for academic writing, but it is a standard element in library catalogs. The fact that hardback and paperback versions get different ISBNs is important for the book trade, but not for scientific communication and library users. The researcher identification ORCID (Open Researcher and Contributor ID) was established in 2009 as a collaborative effort by publishers of scholarly research in order to resolve the author name ambiguity problem in scholarly communication. Many journals now require an ORCID, and it is now used by databases such as Web of Science, but it seems not (yet) to be demanded in academic reference manuals or to be used by library catalogs.

29. Frederick G. Kilgour, "Known-Item Online Searches Employed by Scholars Using Surname plus First, or Last, or First and Last Title Words," *Journal of the American Society for Information Science and Technology* 52, no. 14 (2001): 1203–209, https://doi.org/10.1002/asi.1186.

30. Christiane Behnert and Dirk Lewandowski, "Known-Item Searches Resulting in Zero Hits: Considerations for Discovery Systems," *Journal of Academic Librarianship* 43, no. 2 (2017): 128–134, https://doi.org/10.1016/j.acalib.2016.12.002. The authors investigated the reasons that KISs in discovery systems resulted in zero hits and identified the following reasons: (1) item in stock, but query incorrect (e.g.,

containing spelling errors), (2) item not in stock, (3) item in stock, but incomplete or erroneous metadata, (4) query is ambiguous or not understandable.

31. For example, in the colophon of Rick Szostak, *Integrating the Human Sciences: Enhancing Cohesion and Progress Across the Social Sciences and Humanities*. Routledge, the publication year is 2023, but the book was out, catalogued by the Royal Library in Denmark and borrowed by me in 2022.

32. Marcia J. Bates, "Information Search Tactics," *Journal of the American Society for Information Science* 30, no. 4 (1979): 205–14, https://doi.org/10.1002/asi.4630300406, provided an overview of twenty-nine "information search tactics." She did not explicitly discuss strategies for KISs, but Jeppe Nicolaisen, *Sådan finder du videnskabelig litteratur: databaser og informationssøgning* [How to Search Scientific Literature: Databases and information Searching] (Hans Reitzels Forlag, 2023), found that the combination of two of Bates' tactics, "EXHAUST" (extension of a query) and "REDUCE" (shortening of a query), provide the best results for KISs. Nicolaisen's suggestion is to expand the search request with information that is supposed to match the document sought, and if that document is not found, then reduce the search elements in order to remove potentially defective items and thereby increase the probability of success. In this process, it is helpful to have knowledge about which kinds of errors are common in bibliographical records and an understanding of why such errors occur (e.g., the confusion of family names and given names in documents by Chinese authors).

33. Alan S. Brown, "A Review of the Tip-of-the-Tongue Experience," *Psychological Bulletin* 109, no. 2 (1991): 204–23, https://doi.org/10.1037/0033-2909.109.2.204.

34. Jaime Arguello et al., "Tip of the Tongue Known-Item Retrieval A Case Study in Movie Identification," *CHIIR '21: Proceedings of the 2021 Conference on Human Information Interaction and Retrieval*, 2021: 5–14, https://doi.org/10.1145/3406522.3446021; Samarth Bhargav, Georgios Sidiropoulos, and Evangelos Kanoulas, "'It's on the Tip of My Tongue': A New Dataset for Known-Item Retrieval," In *WSDM '22: Proceedings of the Fifteenth ACM International Conference on Web Search and Data Mining*, 2022: 48–56, https://dl.acm.org/doi/10.1145/3488560.3498421.

35. Catherine M. Dwyer, Eleanor A. Gossen, and Lynne M. Martin, "Known-Item Search Failure in an OPAC," *RQ* 31, no. 2 (1991): 228–36.

36. Dwyer et al. (p. 235) wrote: "While it is tempting to suggest that more and better bibliographic instruction would increase the accuracy and efficiency of patrons' searching, it may be futile to try to provide instruction to the entire student body and/or faculty at an institution if many of them will be such infrequent users of the catalog that they will forget what they were taught before they come into the library again. It would probably be more effective to target instruction in the use of the online catalog and periodical printout to faculty and students who are just preparing to embark on research."

37. Kan and Poo, "Detecting and Supporting Known Item Queries," 93–94.

38. Svend Bruhns, *Bibliografisk Verifikation*, 2nd ed. (Center for Bibliographical Studies, 1999).

39. Possible reasons for the diminishing role of verification in libraries may be: (1) that verification has become easier in the digital environment so that few such requests are received by the libraries, (2) that the absence of direct requests (which formerly often were forms completed in writing) in the online context implies that the users' needs in this respect is not effectively communicated to the libraries, (3) that library administrators have downgraded this service because they believe it has become unnecessary, or (4) that the general library policy has changed toward making such tasks the users' own responsibility.

40. ANSI/NISO Z39.29-2005 (R2010), Bibliographical References, National Information Standards Information, available at: https://groups.niso.org/higherlogic/ws/public/download/12969/Z39_29_2005_R2010.pdf.
41. Reitz, *Dictionary for Library and Information Science*, entry "Descriptive cataloging."
42. Reitz, entry "Subject analysis."
43. Hjørland, "Description." A strong tendency since about 2000 has been to save libraries' own descriptive as well as subject cataloging and replace these with imported data. Therefore, departments for descriptive cataloging and subject classification have mostly disappeared today.
44. National Library of Medicine, for example, distinguishes descriptive and subject cataloging processes: "MMP [*Metadata Management Program*, formerly the *Cataloging and Metadata Management Section*] is responsible for review and development of cataloging policies for descriptive and subject cataloging and classification of all print, audiovisual, and electronic resources and applying them to resources acquired for the NLM collection." (Retrieved January 25, 2025, from https://www.nlm.nih.gov/tsd/tsdhome.html.) *National Library of Medicine* wrote: "A prospective indexer must have no less than a bachelor's degree in a biomedical science" (National Library of Medicine, 2018): "Frequently asked questions about indexing for MEDLINE: Who are the indexers, and what are their qualifications?" http://web.archive.org/web/20180415005151/https://www.nlm.nih.gov/bsd/indexfaq.html. However, "As of April 2022, all journals indexed for MEDLINE are done by automated indexing, with human review and curation of results as appropriate. MeSH indexing for MEDLINE was done completely by human indexers until 2011," https://www.nlm.nih.gov/bsd/indexfaq.html.
45. Concerning descriptive bibliography and subject bibliography, see Hjørland, "Bibliographical Foundations of Information Science."
46. Buckland, "Known Item Search."
47. Buckland, "Known Item Search," 4.
48. Robert Fugmann, "The Complementarity of Natural and Indexing Languages," *International Classification* 9, no 3 (1982), 140–44. Reprinted in *Theory of Subject Analysis: A Sourcebook*, ed. Lois M. Chan, Phyllis A. Richmond, and Elaine Svenonius (Libraries Unlimited, 1985), 392–402.
49. The term "biography" is also used about non-human entities such as libraries and towns, for example, Matthew Battles, *Widener. Biography of a Library* (Harvard College Library, 2004) and Simon Sebag Montefiore, *Jerusalem: the Biography* (Weidenfeld & Nicolson, 2011).
50. Buckland, "Known Item Search," 5.
51. If literature is sought about an individual concept, such as "Copenhagen," many documents may exist, and this is therefore a subject search. If a user is seeking for a particular document about Copenhagen, the term "Copenhagen" therefore is insufficient and other concepts, whether individual or general, have to be included in the search.
52. Buckland here has an endnote 15: "Peter F. Strawson, "On Referring," *Mind* 59, no. 235 (July 1950) 320–44.
53. Buckland, "Known Item Search," 5.
54. See Birger Hjørland and Lykke Kyllesbech Nielsen, "Subject Access Points in Electronic Retrieval," *Annual Review of Information Science and Technology* 35 (2001), 249–98. On pages 251–52 it is explained that "[h]ypothetically, it may be relevant to limit a subject search according to the name of a publisher, a

journal, or even a language code. Subject data are not strictly limited to specific kinds of data; under specific circumstances any kind of data may serve to identify documents about a Subject."

55. If a subject search is performed, and a number of potential relevant documents have been selected, these documents may subsequently be looked up in a library catalog, which is a KIS process. If there are errors in some of their bibliographical descriptions, this may make a further verification process necessary. The point here is that there are no differences in the properties of documents found in subject searching and documents found in known item searching: it is by principle the very same documents.
56. Buckland, "Known Item Search," 3–4.
57. On inter-indexer consistency studies see pp. 614–15 in Birger Hjørland, "Indexing: Concepts and Theory," *Knowledge Organization* 45, no. 7 (2018): 609–39, https://doi.org/10.5771/0943-7444-2018-7-609.
58. David W. Lewis, "Research on the Use of Online Catalogs and Its Implications for Library Practice," *Journal of Academic Librarianship* 13, no. 3 (1987): 152–56.
59. The original quote is in Michael K. Buckland, *Information and Information Systems* (Greenwood Press, 1991), 50; italics in original: "*We conclude that we are unable to say confidently of anything that it could not be information.*"
60. About bibliographical traditions, including descriptive bibliography, see Hjørland, "Bibliographical Foundations of Information Science," and Birger Hjørland, "Bibliography (Field of Study)" In *ISKO Encyclopedia of Knowledge Organization*, eds. Birger Hjørland and Claudio Gnoli, https://www.isko.org/cyclo/bibliography.
61. Slone, "Encounters with the OPAC," 763.
62. See Simon Wakeling et al., "Users and Uses of a Global Union Catalog: A Mixed-Methods Study of WorldCat.org," *Journal of the Association for Information Science and Technology* 68, no. 9 (2017): 2166–81, https://doi.org/10.1002/asi.23708.
63. See, for example, Lydia Dixon et al., "Finding Articles and Journals via Google Scholar, Journal Portals, and Link Resolvers Usability Study Results," *Reference & User Services Quarterly* 50, no. 2 (2010): 170–81, https://doi.org/10.5860/rusq.50n2.170.
64. Elaine Svenonius and Dorothy McGarry, eds., *Seymour Lubetzky. Writings on the Classical Art of Cataloging* (Libraries Unlimited, 2001). On p. 48, the editors wrote "Studies was a landmark in the history of Anglo-American cataloging. To begin with, it was notable for the approach it took. This was a systematic approach, which took its departure from the assumption that before describing a book it is necessary first to be aware of the objectives that description is to serve. Only then it is clear what is and what is not to be included in a bibliographic record. Only with an awareness of the objectives is it possible to evaluate existing rules and to make proposals for change."
65. See further in Rebekah Willson and Lisa M. Given, "The Effect of Spelling and Retrieval System Familiarity on Search Behavior in Online Public Access Catalogs: A Mixed Methods Study," *Journal of the American Society for Information Science and Technology* 61, no. 12 (2010):2461–76, https://doi.org/10.1002/asi.21433.
66. Kan and Poo, "Detecting and Supporting Known Item Queries."

FEATURE

Adopting Critical Cataloging Practices Post Diversity Audit

Connecting the Community to Your Collection

Jessica K. Anderson and Yan Quan Liu

To increase patrons' ability to find resources, it is imperative to investigate barriers and biases in the descriptive catalog data for inclusive collection management and development standards. This study used a specially designed descriptive approach to gather quantitative data from 101 public librarians in Connecticut via a Qualtrics survey to identify the key variables that influence the successful enhancement of online public access catalog (OPAC) metadata after a diversity audit of the library materials. The results revealed factors that promote or impede the integration of inclusive cataloging that reflects the diversity of the community: (1) appreciating the benefits of audit methods that are focused on bibliographic records, (2) recognizing the need for buy-in and participation from the entire organization, and (3) stressing the useful integration of institutional and community feedback to improve the collection's accessibility and representation. The findings provide practical advice to public libraries that want to satisfy the diverse demands of their user base by integrating critical cataloging frameworks into their diversity and inclusion objectives.

Public libraries are, at their very core, institutions that connect individuals with resources. Because a vast amount of information has been generated over time, librarians play an important role in curating and organizing this knowledge in a manner that is useful, understandable, and convenient for their patrons. These materials must also mirror the "interest(s), information, and enlightenment of *all* people of the community the library serves."[1] However, not all patrons see themselves reflected in the selected books, and others struggle to discover relevant results in the online public access catalog (OPAC) due to outdated or problematic search terms.[2] This disconnect between established professional standards and actual practice has compromised the library's mission to guarantee that "the right of accessing information is not denied and that equitable services are provided for everyone."[3] In response, some libraries are evolving and refining their collections and metadata to remain inclusive and responsive to the needs and identities of their diverse patrons.

Two emerging strategies to address these issues are: (1) undertaking diversity audits of the physical collection, and (2) employing critical cataloging practices to improve metadata descriptions. Popularized by Karen Jensen in 2017, diversity audits, "as they pertain to collection development," are a recent trend in reaction to the long-standing need for greater diversity, equity, and inclusion in library services.[4] The audit process requires libraries to review and analyze their collection to identify any gaps in representation that would align with the needs and identities of their community. This concept

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embodies the foundational principles of the Library Bill of Rights and the "mirrors and windows" metaphor by Rudine Sims Bishop, who argued that books should serve as mirrors for readers to see themselves and as windows to understand the lives of others.[5] Various methods exist for conducting this audit. Still, the common overarching goal is to bridge the aforementioned gaps through improved collection management and development efforts—where the data can then be used "to guide purchasing decisions, track progress, and keep stakeholders informed about diversification efforts."[6]

Building on the insights gained from diversity audits, some libraries have taken further steps and subsequently remedied issues within their OPAC—which is "a catalog of bibliographic records for materials available from or through a specific library or library system" that can be "accessed online by the public" and "without the assistance of library staff."[7] Recognizing the OPAC's role in resource accessibility, these libraries have taken a proactive approach to making their diverse collection more accessible by adopting inclusive cataloging practices. Critical Cataloging, as this movement has been aptly named, fulfills the need to update the machine-readable cataloging (MARC) records to be more representative of users. This involves "questioning the status quo and seeking alternative controlled vocabularies," such as keywords, subject headings, and other descriptive information patrons rely on to locate and access materials in a convenient and self-sufficient manner.[8]

Although there is substantial literature on diversity audits and critical cataloging individually, there is a noticeable lack of studies examining the relationship between the two. As stated by Rachel Jaffe, "There has been discussion of the shortcomings, politics, and bias implicit in traditional cataloging and metadata tools and standards, [but] not as much attention has been paid to questioning how we assess metadata quality and what constitutes good metadata."[9] In particular, there are very few or no research studies that explore the decision-making process behind public libraries' choices when updating their OPAC's MARC records after a diversity audit of their collection.

To fill this void, we explored the overarching research question: *What are the primary motivations and evaluative criteria that drive Connecticut public libraries to adopt critical cataloging practices after a diversity audit?* Our aim was to identify common variables or choices among responding libraries that have conducted collection audits—such as community characteristics, audit methods, user feedback, and implementation challenges—to reveal patterns that can inform other institutions with similar needs. How can diversity audits assist in implementing critical cataloging practices after an audit? For the future, this understanding is vital to fostering a welcoming environment in both physical and digital spaces. It could also serve as a guiding model for other public libraries contemplating a revamp of their cataloging practices.

Literature Review

The American Library Association (ALA) "affirms that equity, diversity, and inclusion are central to the promotion and practice of intellectual freedom," and librarians must incorporate these principles into all aspects of their work.[10] As a result, diversity audits and critical cataloging have emerged as prominent strategies in the librarian's toolkit.

Purpose and Scope of a Diversity Audit

Within the context of a library, a diversity audit entails assessing the "diversity represented by subjects, fictional characters, authors, and illustrators" of the existing items in the collection—books, audiobooks, and other resources.[11] Findings are then compared to the patron population statistics to establish goals aligned with community needs (e.g., ethnicities, religions, socioeconomics). Each process must be adapted to fit the individual libraries "to yield the most efficacy."[12] Overall, a diversity audit not only evaluates the degree of inclusivity of the current collection but also sets a foundation for continuous improvement.

Despite having autonomy over the diversity audit, the 2022 *Library Journal* Materials Survey reported that less than half of responding libraries (46 percent) had completed an audit. Only 22 percent have "both conducted a diversity audit and set goals for increasing representation in their collection."[13] This percentage has increased since *Library Journal*'s 2019 survey, where only 9 percent had completed one, and 14 percent planned to do so in the future. Yet, more libraries must undertake an in-depth diversity audit to truly evolve.[14] This trend highlights a growing recognition of the importance of diversity audits yet underscores the persistent barriers libraries face.

Methodologies for Diversity Audits

Annabelle Mortensen, echoing the *Library Journal* article, highlights the pressing need for comprehensive diversity audits but notes that many libraries avoid them due to "the difficulty of developing a methodology that fits within already heavy workloads."[15] To address this, she planned for a "two-year audit designed to cultivate insights without overwhelming staff." However, she had to create a new methodology, as her "research failed to identify any libraries that had taken on such an enormous audit to use as a model."[16] Using a Google Forms checklist to categorize diversity attributes, her hands-on approach provided valuable insights for future initiatives despite being time intensive.

In recent years, standardized templates—such as checklists, catalog searches, book inspections, and the reframing method—have made audits more accessible.[17] Most approaches, like Mortensen's, emphasize hands-on methods, but some, like reframing, require critical cataloging for long-term impact. Treshani Perera's study supports this, finding that 35 percent of responding librarians (n=130) "consider creating a sustainable process for future inclusive description work to be of the highest importance."[18] To achieve these lasting benefits, Renate Beilharz suggests using audit data to add consistent keywords, improving accessibility while preserving past work.[19] Hence, critical cataloging practices are not only essential for realizing the immediate benefits of diversity audits but also key to their lasting impact.

Kara Bledsoe et al. also discuss the reform of cataloging practices when developing an audit model, citing the University of Alberta Library's Decolonizing Description Project (DDP) as an example; they suggest using the "reframing method" because "it can be implemented by identifying opportunities to apply new descriptions to the materials and/or present the materials in new ways through different discovery and access mechanisms."[20] Their study showed that this method could "open up opportunities to engage stakeholder groups" and "connect collections to new research."[21] This effort

was carried out within an academic institution, however, which provided resources that public libraries often lack—such as time, funding, and content experts. This difference implies that audit methodologies need to be flexible to various institutional contexts.

Regrettably, altering bibliographic records is not an easy task without resources such as those mentioned above. Limited personnel for description work is a significant barrier, with 86 percent of participants in Perera's study identifying it as a challenge (n=138).[22] Brian Clark and Catherine Smith also warned that "the intellectual task of updating the classification scheme and the manual labor of re-cataloguing thousands of records and relabeling items is huge."[23] Due to the complexity of this venture and the imperfect nature of the results, most public libraries tend to focus solely on maintaining and developing their collections during the audit. Collectively, these studies emphasize the need for practical, scalable audit methodologies that consider the limited resources of public libraries.

Bridging Gaps with Critical Cataloging

Despite sincere efforts by librarians to promote the newly diverse offerings post-audit, many titles remain reliant on patrons discovering them by browsing the shelves or by searching the OPAC. Elizabeth Hobart found retrieving records that lack appropriate keywords or subject headings difficult, noting that the catalog "always provided enough information for known title searching, but often lacked resources beyond that."[24] This stresses the need to incorporate inclusivity directly into standard library cataloging procedures so patrons can discover all titles. Without this step, items "insufficiently or incorrectly represented become effectively lost if they cannot be surfaced by a subject or keyword search within a public-facing catalog," rendering "a sizeable percentage of the library's available resources" inaccessible to the public.[25]

Critical cataloging aims to solve this issue by questioning the inaccuracies and harmful ideologies built into the current descriptive practices and knowledge organization systems, such as the Library of Congress Subject Headings (LCSH). Just as diversity audits have evolved into flexible, templated methods with clear evaluative criteria, critical cataloging methods need a structured framework to support consistent and inclusive practices. As Perera points out, "dismantling biases in cataloging systems, standards, and tools can only be accomplished with systemic change. Systemic change is a collective responsibility."[26]

The Core Competencies for Cataloging and Metadata Professional Librarians could potentially serve as such a collective-based guide. Still, Bruce Evans et al.'s 2023 survey assessing its use found limited awareness and application of the document. Of the 399 respondents to the question, "Have you used the *Core Competencies* in your work? (select 'Yes' or 'No')," 65 percent responded "No," highlighting the need for revisions that incorporate diversity and inclusion and critical cataloging practices.[27] Their report suggested improvements in three areas: (1) updating technical competencies, (2) involving subject matter experts from other fields, and (3) increasing the document's visibility. In short, revising and promoting the *Core Competencies* is vital for addressing systemic biases in metadata systems.

Understanding Critical Cataloging

Inclusive catalog management practices are recognized as part of a broader effort to scrutinize the assumed neutrality of library metadata. Unbiased knowledge organization systems do not exist, as they are designed by humans and thus reflect societal attitudes, policies, events, and conditions of the time.[28] Nevertheless, libraries must rely on them to provide access to resources. Due to this issue, a critical examination of these systems, as well as the institutions themselves, is necessary. The movement for Critical Librarianship does so by challenging the alleged neutrality of the discipline and acknowledging the structures of "power and privilege that underpin the profession."[29]

As a part of this movement, Critical Cataloging aims to expose the subject headings, class numbers, and library metadata that contribute to the barriers and biases in these systems. Jennifer Martin, referencing institutions such as the International Federation of Library Associations and Institutions (IFLA), underscores the importance of cataloging ethics since it "draw[s] on the primary values of serving the needs of users and providing access to materials."[30] Neutrality, a core value within the profession, has generally been a way to fulfill this duty—even though it is not explicitly mentioned in the ALA Code of Ethics.[31]

Despite the good intentions behind impartiality, it frequently conceals existing biases. As such, Jaffe asks: "do we claim neutrality or objectivity, or do we start questioning our purpose and practice?" Just as there are inevitable gaps in a collection, accurate representation within the OPAC "cannot be expected to be flawless" since metadata are "manifestations of human effort."[33] This discovery should prompt a reevaluation of these standards to serve accessibility goals better.

Jaffe's research touches on this problem, critiquing current cataloging processes and advocating for quality metadata. This includes shifting from evaluative, quantitative models to ones that include ethical, qualitative aspects since existing frameworks often overlook the impact on end-users and communities beyond the library profession.[34] Therefore, we addressed these shortcomings in our study by including survey questions targeting: (1) improvements to catalog accessibility, (2) development of inclusive keywords and subject headings, and (3) criteria for evaluating metadata. These topics also helped identify additional challenges libraries encounter when implementing inclusive cataloging practices.

Challenges in Implementation

The practice of critical cataloging, highlighted by #CritCat, is not new to social justice. Librarians like Sanford Berman, Hope Olson, and Emily Drabinski have long worked to reform problematic controlled vocabularies such as the Library of Congress Subject Headings (LCSH) and Sears List of Subject Headings.[35] These metadata frameworks, which have been in widespread use for over a hundred years, provide a structured way to categorize and access material records based on subject content—where "its scope has expanded far beyond the initial offerings first published in the early twentieth century."[36] Thus these terms are integral to the library's search system, making patrons' ability to retrieve relevant results reliant on the consistency and standardization provided by this authority control process.

The National Information Standards Organization's principles reiterate this by stating that good metadata should conform to community standards, be appropriate to the collection and its users, and support interoperability.[37] Yet, as the *Statements of Ethical Principles* created by the Cataloging Ethics Steering Committee remind us: "We recognise that interoperability and consistent application of standards help our users find and access materials. However, all standards are biased."[38]

Despite their importance, controlled vocabulary, such as subject headings, are "inconsistent, slow to change, and inadequate in representing certain topics"—where the Library of Congress (LC) choices may not match the patron's search terms when using the OPAC, leading to a decline in the results' efficacy.[39] One could use unauthorized terms that make the most sense to patrons and authors, but it is not easy to simply change problematic authorized subject headings. All formal changes need to be submitted to the LC, which is a lengthy and complex process.[40] Due to this procedure, we hypothesized that interoperability would be a common challenge among our participant libraries—especially when unauthorized terms are used in records.

Varying Definitions of Diversity

Interoperability is further complicated because "there is no one definition for 'diversity,' nor is there a methodology that can adequately account for the full breadth of diversity."[41] Karen Snow and Anthony Dunbar believe "the weight placed on efficiency contributes to centering on Whiteness," as the cataloging community often sees "everything else outside this structure as a deviation from the cataloging processes."[42] The focus on efficiency means catalogers "are less likely to discuss alternative opinions, even if those opinions could be more encompassing and justice-oriented than the current standards."[43] This severely hinders the process of confirming that the library's MARC records can accurately and inclusively represent the items—while also still being effectively retrieved during a search of the catalog.

Although there is no consensus on the definition of diversity, C. Rockelle Strader suggests adding keywords to serve "as entry points into the catalog and as guides for the assignment of controlled terms that have already been established" to compensate for lacking or offensive subject headings.[44] By incorporating these additional keywords, libraries can enhance discoverability and provide more culturally sensitive access points, potentially mitigating the limitations of standardized subject headings.

Clark and Smith also address the lack of recognized procedures by presenting a quantitative methodology to analyze established subject headings using R and Python to improve cataloging policies and collection development.[45] Their approach emphasized inclusive language for marginalized groups as a framework for evaluating MARC data. However, the findings indicate a need for a deeper understanding of each keyword's cultural implications and its relation to the library's community. Additionally, the study was limited to one academic institution and did not address ethical issues in selecting and replacing problematic subject headings. In contrast, our research examined multiple

public libraries and included survey questions on how librarians select cataloging guidelines for inclusive subject headings and keywords.

Requirement of Subject-Matter Experts and Community Involvement

Unfortunately, with their expertise in bibliographic management, most catalogers "act as generalists" and "rely on cooperative cataloging for resources on subjects too far outside of [their] comfort zone."[46] As a result, public librarians have leaned heavily on existing knowledge organization systems. Consequently, Clark and Smith found that "systemic issues of general cataloging practices, like those exhibited in LCSH, are often pervasive at the local level of cataloging responsibility."[47] Given these challenges, it is evident that input from subject matter experts is needed to develop comprehensive definitions and methodologies.

Sheila Laroque identifies this as the objective of the aforementioned DDP, whose aim was "creating new, more accurate and appropriate subject headings within our classification schemes" by "investigating more respectful ways of building relationships with Indigenous communities."[48] The project successfully engaged this target population, which provided invaluable insights and led to developing subject headings that more accurately reflect Indigenous knowledge and perspectives. Although this project focused on a specific group, Laroque asserts that it is "essential to reflect this type of outward work for other institutions that would be interested in achieving similar goals."[49]

In fact, the DDP Symposium showed that "people were interested in more of the technical details and in discussing what and, more importantly, how these changes will be made possible."[50] This indicates a growing interest in shifting from diversifying a collection to making it accessible through inclusive bibliographic records, as well as understanding which professional documents librarians can depend on. Considering that "only a small subset of library professionals work at the intersection of metadata and DEI," conducting research to locate and share such expert insights is not only relevant but essential to improving local accessibility to the library collection as well.[51]

Engaging the community, particularly library users, offers another avenue for improving cataloging practices, for they "are also experts in the ways that our systems have either helped or hindered their research processes."[52] A study by Anitra Gates et al. suggests leveraging user-provided data from the diversity audit to pinpoint the subject headings that may have otherwise gone unnoticed.[53] Their research showed that some libraries included patron-driven subject access in the OPAC as a replacement or additional description through a tagging system, which allows library users to collaborate in developing other access points (e.g., #OwnVoices).[54] This approach may not fully capture the need to "include individuals of historically excluded populations in this collaboration." Still, it is a start to an endeavor that would otherwise be very time intensive.[55] Recognizing these limitations, our study seeks to identify additional strategies that ensure broader engagement in enhancing catalog records post diversity audit.

Leveraging Related Studies for New Research Frameworks

The need for inclusive descriptions in bibliographic records has gained recognition in recent years, particularly for literature published after 2020. Although many studies focus on understanding the philosophy and challenges of critical cataloging, they also suggest methodologies and future implications that can lead to actionable solutions.

Despite the positive steps highlighted in these articles, the interconnected nature of diversity audits of the collection and its effects on subsequent metadata enhancements has not been thoroughly studied, particularly at a local public library level. Academic libraries have "mastered" this feat, like the University of Colorado Boulder, Xwi7xwa Library, and the University of Arizona, but it is essential to enhance the understanding of how libraries of all types can integrate these two aspects.[56] Developing a guide for merging audit findings with critical cataloging practices in public libraries will require collecting insights from related studies—addressing topics such as creating guides, evaluating descriptive terms, and developing assessment methods—while tailoring it to the unique needs of the patron community.

Building on existing literature, our study aimed to clarify the direct impacts of diversity audits on catalog accessibility and inclusivity. Previous research identified gaps in the critical cataloging discourse, but it did not do an in-depth investigation into key variables that inform public libraries' decisions to enhance metadata accessibility post diversity audit. Thus our study is pivotal in transitioning from theoretical underpinnings to practical application by outlining a methodological framework for successful critical cataloging at the local public library level, thereby creating accurate, complete, consistent, *and* inclusive bibliographic records.

Methodology

The lack of literature specifically on constructing a framework for critical cataloging practices using the data from diversity audits motivated the authors to adopt an online survey approach. This method aimed to explore an under-researched area by gathering quantitative data about variables impacting diversity and inclusion efforts, generating insights to inform future qualitative studies.

Survey Design

Although the primary aim of this research was to investigate the motivations and criteria underlying the adoption of critical cataloging practices in Connecticut public libraries after diversity audits, survey questions were developed to elicit practical information about the study's overarching research purpose. These questions were informed by identified gaps in the literature, guaranteeing a focus on essential issues driving cataloging decisions:

RQ1: How do the geographic setting, population size, and patron demographics of Connecticut public libraries influence the implementation of critical cataloging practices after a diversity audit?

RQ2: How do diversity audit approaches influence the adoption of critical cataloging practices, and what is their impact on catalog accessibility and inclusivity?

RQ3: What role does the assessment of patron feedback and user needs play in implementing critical cataloging practices post diversity audit?

RQ4: What challenges do Connecticut public libraries face during and after implementing critical cataloging practices, and how do these challenges affect the process?

From these research questions, key variables were identified as likely to influence a public library's strategic plan for enhancing representation within metadata post-audit. Clark and Smith found that "local cataloging practices can vary widely at both the institutional and individual level depending on a library's size, purpose, goals, level of specialization, finances, and staffing."[57] In response, our final variables included library classification, patron demographics, diversity audit process, catalog accessibility, feedback mechanisms, implementation challenges, and personal experiences. Survey questions were then developed based on these categories, aligning them with the study's overarching objectives.

Qualtrics was chosen as the research platform for its capabilities in creating, administering, and analyzing complex surveys, as well as its ability to collect informed consent. Participants were provided with details of how the platform protected participant privacy and confidentiality through the omission of identifiable information, including names, email addresses, or IP addresses.

The final survey encompassed three participant screening questions, fifteen closed-ended questions, and three short-response questions designed to collect measurable data and provide deeper insights into the decision-making processes after a diversity audit. The first two screening questions automatically disqualified those who did not meet the participant criteria, which required being a Connecticut public librarian who had conducted a diversity audit. The complete survey is available in Appendix A.

Participant Requirements

The anonymous survey started with three screening questions to ensure the proper participant pool was targeted. The first question asked, "Are you employed as a librarian or staff member at a Connecticut public library?" The second question asked, "Has your library conducted a diversity audit?" Participants were required to work at a library that had completed a diversity audit because these librarians (1) actively evaluate their collections for diversity, (2) possess the experience and insights needed to discuss the impact of these audits on cataloging practices, and (3) could provide focused, relevant data. In contrast, librarians without diversity audit experience were excluded because they lacked the foundational experience and specific knowledge needed to contribute meaningfully to the study's objectives.

Respondents then answered the third screening question: "Has your library adopted critical cataloging practices as a result of the diversity audit?" None of the participants were automatically exited since all

three categories offered valuable data. We believed that (1) "Unsure" librarians may engage in critical cataloging practices without formally recognizing them as such, and (2) "No" librarians could provide data for comparing variables.

Based on these participation requirements, as well as the progression of survey topics, we were aware that there would be a steady drop-off rate in responses. It was hypothesized that the librarians who were "Unsure" of their involvement in diversity audits and/or critical cataloging might exit once it became clear that they had not been a part of these practices, and "No" librarians would exit when questions involved cataloging.

Recruitment Process

We used a non-probabilistic purposive sampling strategy, targeting Connecticut public librarians who had completed a diversity audit, and applied convenience methods such as listservs and social media for recruitment. Using the Qualtrics sample size calculator, the ideal response size was determined to be ninety-three participants (95 percent confidence level with an 8 percent margin of error) based on the 240 public libraries in Connecticut.[58] However, since the study focused on libraries that had conducted diversity audits—a subset estimated at approximately 110 libraries based on *Library Journal's* data suggesting 46 percent of libraries have done so—the sample size was recalculated to sixty-three responses.[59] We maintained the same 95 percent confidence level and 8 percent margin of error to better represent this group.

Participants were recruited through state library listservs (CONNTech), social media groups, and direct contact with institutions like the Connecticut Library Consortium (CLC) and Connecticut Library Association (CLA). Using the contact list provided by the Division of Library Development (DLD), each library was sent the request directly through their website.

Data Collection and Analysis

Data collection occurred over a two-week period, concluding on March 20, 2024. We analyzed the quantitative data using Qualtrics' Stats iQ and Crosstabs iQ tools to calculate descriptive statistics, such as frequencies and percentages, and to explore potential correlations between variables like geographic setting, population size, and diversity audit outcomes (Pearson's chi-square tests). Though we did not conduct an extensive qualitative analysis, the short responses provided additional insights into some participant choices. Thematic analysis, using Qualtrics Text iQ, revealed themes such as inclusive representation, resource limitations, adaptive strategies, and systemic barriers. These themes informed our discussion, offering valuable context for understanding how diversity audits influence cataloging practices.

The results are sequentially organized based on our survey questions to achieve our overall objective of identifying the primary motivations and evaluative criteria that lead Connecticut public libraries to adopt critical cataloging practices after a diversity audit.

It must be noted that participants were allowed to select multiple options for applicable questions. This means the total number of selections for some questions exceeded the number of participants, resulting in cumulative percentages greater than 100 percent. For example, if Choice A was selected by fifteen out of fifty-six respondents (n=15/56; 27 percent), this indicates that 27 percent of participants selected Choice A.

Results

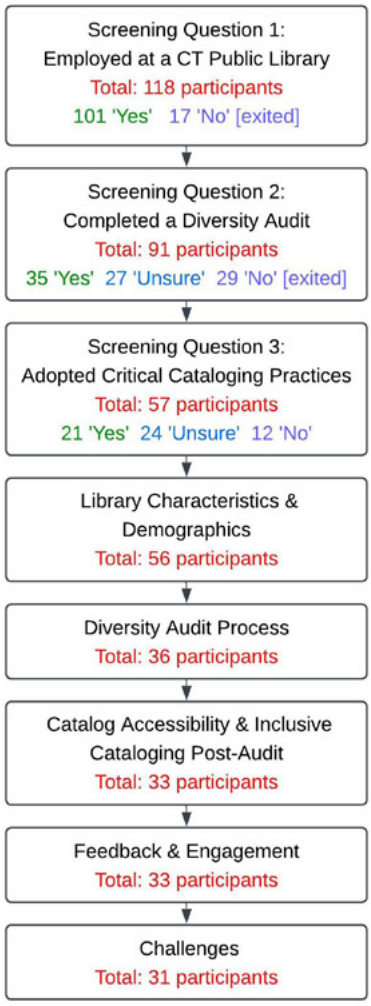
Out of the 171 people who opened the survey, fifty-three exited after reading the participation requirements, leaving 118 to complete the three screening questions. The first screening question then eliminated an additional seventeen respondents who did not meet the targeted criteria. This resulted in 101 remaining participants—all Connecticut public librarians who met the requirements outlined in our promotional materials.

For the second screening question, librarians were asked whether their library conducted a diversity audit of their collection. A definition of diversity audit was provided for clarification, and the option to choose "Unsure" was included to accommodate librarians who may refer to the audit by a different name, such as collection assessment or catalog analysis. The survey was coded to exit-out those who did not complete an audit, which was 32 percent (n=29) of the ninety-one answering respondents, as their experiences were not relevant to the topic. Of the remaining librarians, thirty-five responded "Yes" (38 percent). However, there was a surprising number of librarians who were "Unsure" (n=27; 30 percent) of their library's involvement in an audit.

The last screening question aimed to establish the respondent's involvement or awareness of their library's integration of critical cataloging practices. Of the fifty-seven librarians, 42 percent were "Unsure" (n=24), 37 percent responded "Yes" (n=21), and 21 percent "No" (n=12). None of the respondents were exited from the survey to allow for an analysis of differences in approaches or perceptions among libraries at varying levels of engagement with critical cataloging practices.

As the survey progressed, the number of participants gradually decreased as questions became more specialized, reflecting the expected drop-off of librarians uncertain about diversity audits or critical cataloging practices. As seen in figure 1, a flowchart of participation rates for each section, the final number of participants was thirty-one.

Figure 1. Participation Rates for Survey Sections



Library Characteristics and Demographics Do Not Predict Critical Cataloging Practices

Next, to better understand how library characteristics and demographics influence cataloging practices, we explored the profiles of participating libraries (figure 2). The fifty-six representatives came from forty suburban libraries (71 percent), ten rural libraries (18 percent), and six urban libraries (11 percent). The majority of library communities were either "moderately diverse" (n=17/52; 33 percent) or "slightly diverse" (n=16/52; 31 percent); the remaining participants came from either "highly diverse" (n=13/52; 25 percent) or "not diverse" patron populations (n=6/52; 12 percent). Librarians also represented the same number of "mixed income" and "high income" (each: n=17/52; 33 percent) populations; ten had patrons of "middle income" (19 percent), and eight had "low income" (15 percent).

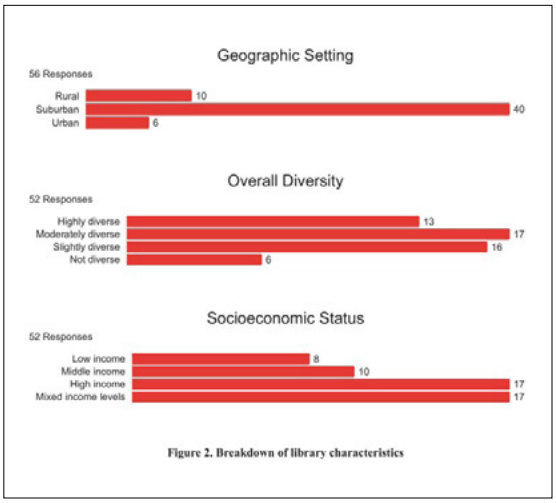


Figure 2. Breakdown of library characteristics

We then isolated the participants who answered "Yes" to both conducting a diversity audit (screening question 2) and adopting critical cataloging practices (screening question 3). This subset allowed us to investigate whether certain library characteristics or demographics could predict inclusive cataloging processes. Descriptive analysis demonstrated that the majority of responding libraries that completed both processes were categorized as serving "suburban" (n=8/11; 73 percent), "moderately diverse" (n=4/11; 36 percent), and "high income" (n=4/11; 36 percent) communities.

Chi-square tests revealed no statistically significant relationships between library characteristics (such as geographic setting and patron demographics) and the implementation of critical cataloging practices. However, we believe the detailed responses from this subset of librarians may still offer valuable insights. The statistical report for these participants, who completed the entire survey, can be found in Appendix B.

Metadata-Focused Audit Methods Lead to Greater Accessibility Over Hands-On Approaches

Table 1. Audit method used

34 Responses

Audit Method	Choice Count
Catalog Search Method: Analyzing catalog data for diverse titles/authors	32% 11
Checklist Method: Utilizing a diversity checklist to review each collection item's representation	29% 10
Book Inspection Method: Conducting hands-on reviews of books to assess the diversity	50% 17
Reverse Diversity Audit: Identifying gaps by checking for specific diverse titles/authors	41% 14
Sampling: Evaluating random samples from the collection to gain insights into its overall diversity	15% 5
Vendor-Assisted Audit: Employing a third-party vendor to conduct the diversity audit	18% 6
Reframing Method: Applying new descriptions to the existing materials	21% 7
Other	12% 4
Total	34

The relationship between specific audit methods and the likelihood of adopting critical cataloging practices was then examined. Participants were asked to indicate the audit method(s) they used, where the question allowed for multiple selections. The Book Inspection method received the most selections, with seventeen of the thirty-four participants (n=17/34; 50 percent) showing a preference for this hands-on method. In contrast,

the Catalog Search Method, which entails using OPAC metadata to identify diverse titles/authors based on specific themes, subjects, or backgrounds, was used by eleven participants (n=11/34; 32 percent). As seen in table 1, the majority of respondents are conducting hands-on reviews of books to assess the diversity of content, characters, and authorship.

A comparative analysis using Qualtrics' Stats iQ was then conducted on the relationship between Critical Cataloging and Audit Methods (table 2) to see if those who updated their records chose different audit methods than the other participants. The colors on the chart correspond to different audit methods, with the length of each colored bar indicating the method's usage percentage among libraries with varying commitments to critical cataloging practices. This visual setup allows for a quick comparative analysis of the preferred audit methods across the "Yes," "Unsure," and "No" response groups.

Table 2. Critical cataloging practices vs. audit method used

Critical Cataloging Practices (Total Participant Count)	Audit Method	Count	Percent (Count / Total Participant Count)
Yes (13 participants)	Catalog Search Method	7 of 13	54%
	Book Inspection Method	6 of 13	46%
	Reverse Diversity Audit	6 of 13	46%
	Checklist Method	4 of 13	31%
	Reframing Method	4 of 13	31%
	Sampling	3 of 13	23%
	Vendor-Assisted Audit	3 of 13	23%
	Other	1 of 13	8%
Unsure (11 participants)	Book Inspection Method	6 of 11	55%
	Reverse Diversity Audit	4 of 11	36%
	Checklist Method	2 of 11	18%
	Other	2 of 11	18%
	Reframing Method	2 of 11	18%
	Vendor-Assisted Audit	2 of 11	18%
	Catalog Search Method	1 of 11	9%
	Sampling	1 of 11	9%
No (10 participants)	Book Inspection Method	5 of 10	50%
	Checklist Method	4 of 10	40%
	Reverse Diversity Audit	4 of 10	40%
	Catalog Search Method	3 of 10	30%
	Other	1 of 10	10%
	Reframing Method	1 of 10	10%
	Sampling	1 of 10	10%
	Vendor-Assisted Audit	1 of 10	10%

The results demonstrated that the Catalog Search Method was used by a majority (n=7/13; 54 percent) of those participants who responded "Yes" to critical cataloging. In contrast, as seen in table 2, only 30 percent of those who answered "No" (n=3/10) to critical cataloging and 9 percent of those who were "Unsure" (n=1/11) used the Catalog Search Method. Instead, they opted to work with hands-on methods, like Book Inspection. This preference may stem from the perception that the Catalog Search Method would require additional staffing, particularly more catalogers, to manage the work needed to update OPAC records.

To further explore the effectiveness of these audit methods, we isolated the subset of participants who updated their metadata using the Catalog Search Method (n=11) to determine if these libraries paired analysis of bibliographic records with a hands-on approach, as Beilharz discussed (table 3).

Table 3. Audit methods paired with 'catalog search'

11 Responses

Participants who used 'catalog search method' also used:		Choice Count
Checklist Method: Utilizing a diversity checklist to review each collection item's representation	36%	4
Book Inspection Method: Conducting hands-on reviews of books to assess the diversity	45%	5
Reverse Diversity Audit: Identifying gaps by checking for specific diverse titles/authors	64%	7
Sampling: Evaluating random samples from the collection to gain insights into its overall diversity	18%	2
Vendor-Assisted Audit: Employing a third-party vendor to conduct the diversity audit	18%	2
Reframing Method: Applying new descriptions to the existing materials	18%	2
Other	9%	1
Total		11

The results revealed a strong tendency toward a dual strategy, with seven participants (n=7/11; 64 percent) also using the Reverse Diversity Audit—a method that combines metadata analysis with hands-on review—and five participants (n=5/11; 45 percent) incorporating the hands-on Book Inspection Method. This finding suggests that most participants who update cataloging practices implement multiple audit methods rather than relying on a single strategy.

With the audit methods established, we then examined which specific library collections were prioritized for diversity audits and cataloging changes. The thirty-five participants selected the following choices, listed from most to least frequently targeted: (1) Entire Collection (n=11/35; 31 percent), (2) Children's Collection (n=10/35; 29 percent), (3) Young Adult Collection (n=9/35; 26 percent), (4) Adult Collection (n=7/35; 20 percent), (5) Fiction Collection (n=6/35; 17 percent), and (6) Non-Fiction Collection (n=3/35; 9 percent).

Next, in order to analyze the impact of specific collection audits on cataloging guideline changes, we separated responses that belonged to those who implemented critical cataloging frameworks post-audit. By filtering results through the variable Critical Cataloging Practices with values equaling "Yes" (table 4), it became apparent that this subsample of fourteen libraries was more likely to have audited the children's (n=5/14; 36 percent) and young adult collections (n=5/14; 36 percent), indicating a prioritization of these sections. We explore theories for this finding in the Discussion.

Table 4. Audited collections by critical cataloging libraries

14 Responses

Library Collection		Choice Count
Adult	29%	4
Children's	36%	5
Young Adult	36%	5
Fiction	29%	4
Non-Fiction	21%	3
Entire Collection	29%	4
Reference	0%	0
Other	0%	0
Total		14

Libraries Prefer Customized, Community-Driven Cataloging Procedures Over Formal Critical Cataloging Documents

With audit methods and collection focus areas established, the next step was to explore how these efforts translated into cataloging changes. While the survey questions began exploring critical cataloging topics, there was a slow drop-off rate in responses—which left only thirty-three participants (as seen in figure 1). As mentioned in our Methodology, this was foreseen. Up until this point,

respondents who had answered "Unsure" or "No" were able to contribute data, but cataloging questions were more in-depth from this point forward.

The above was confirmed with the first question, which asked if any improvements were made to catalog accessibility, as the choice "no changes were made" had the highest choice count (n=18/33; 55 percent) from the thirty-three librarians. The remaining participants indicated they (1) "updated MARC records" (n=8/33; 24 percent), (2) "enhanced searchability with keywords/tagging" (n=8/33; 24 percent), and (3) "created more inclusive keywords/subject headings" (n=7/33; 21 percent).

Results from the second question provided a list of standards, guidelines, and frameworks used by libraries to evaluate the inclusivity of their bibliographic data (table 5). The top guidelines selected by the thirty total participants were (1) "own institution's inclusivity guidelines" (n=9/30; 30 percent), (2) "guidelines from professional associations, like IFLA or ALA" (n=8/30; 27 percent), and (3) "feedback from the community members or library users" (n=8/30; 27 percent). Two choices, "critical cataloging practices or frameworks" (e.g., #CritCat) and "Cataloguing Code of Ethics," were selected the least (n=2/30; 7 percent for each)—which, despite recent literature's assertion of its value, demonstrates a lack of adoption or awareness in the field.

Table 5. Standards for evaluating MARC records

30 Responses

Cataloging Standards:		Choice Count
Cataloguing Code of Ethics	7%	2
Authorized Knowledge Organization Systems, such as Library of Congress Subject Headings	20%	6
Resource Description and Access (RDA)	10%	3
Own institution's inclusivity guidelines	30%	9
Feedback from community members or library users	27%	8
Author-generated subject headings and keywords	10%	3
Vendor-provided subject headings and keywords	23%	7
Guidelines from professional library associations (e.g., ALA, IFLA)	27%	8
Critical cataloging practices or frameworks	7%	2
None	20%	6
Other	17%	5
Total		30

It was also notable that the practice of using "author-generated subject headings and keywords" was used by three participants (n=3/30; 10 percent). Although this is a small percentage, this effective method is often a completely overlooked one, according to Strader.[60]

The objective of the last question in this section was to answer the overarching research question, specifically the motivational aspect of completing a diversity audit *and* making bibliographic data changes. In line with the hypothesis generated from related literature, findings showed that most of the thirty-two participants chose to change their cataloging practices to (1) "enhance discoverability of diverse materials" (n=16/32; 50 percent), (2) "better reflect the diversity of their community" (n=15/32; 47 percent), and (3) "address and rectify biases in existing cataloging practices" (n=14/32; 44 percent).

Successful Integration of Critical Cataloging Practices Relies on Institution-Wide Engagement

Having examined the motivations behind cataloging changes, the next step was to evaluate how effectively these practices were implemented. Participants were asked to assess the success of integrating critical cataloging practices (see figure 3). The majority of the twenty-seven librarians believed their method was "moderately effective" (n=13; 48 percent), whereas five participants (19

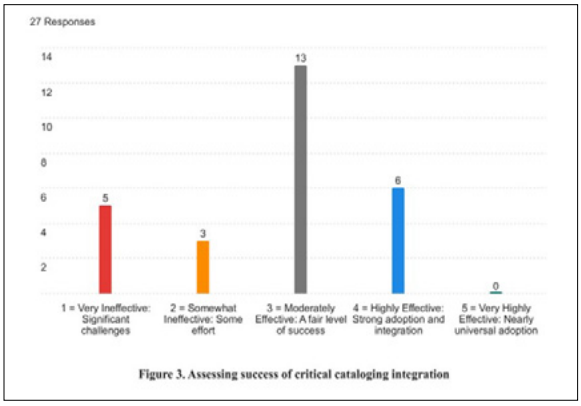


Figure 3. Assessing success of critical cataloging integration

percent) reported that it was "very ineffective," and six were "highly effective" (22 percent). None reached "very highly effective" (0 percent). Given that many libraries are still in the initial stages of implementing these practices and have faced challenges, it is not surprising that a significant number of libraries consider their efforts to be moderately effective at this stage.

When conducting a comparative analysis of "effectiveness of critical cataloging integration" versus "catalog accessibility improvements," as illustrated in table 6, most respondents who categorized their integration effectiveness as "moderately," "somewhat ineffective," or "very ineffective" also chose "no changes were made to the catalog." However, one can see that the respondents who marked "highly effective" (n=6) made the following improvements to their catalog: (1) created more inclusive keywords/subject headings (n=5/6; 83 percent), (2) enhanced searchability of diverse materials using keywords/tagging (n=4/6; 67 percent), and (3) updated MARC records to reflect diverse and inclusive content (n=4/6; 67 percent). This comparative analysis should be investigated further, but the initial findings suggested that such catalog changes contribute to more successful integration of critical cataloging practices.

Table 6. Relating critical cataloging integration and catalog accessibility improvements

Level of Critical Cataloging Integration (Total Participant Count)	Catalog Accessibility Improvements	Count	Percent (Count / Total Participant Count)
Highly Effective (6)	Created more inclusive keywords and/or subject headings using Library of Congress Subject Headings (LCSH)	5 of 6	83%
	Enhanced the searchability of diverse materials in the catalog (ex. patron-generated tagging)	4 of 6	67%
	Updated MARC records to reflect diverse and inclusive content (reassessing the existing records)	4 of 6	67%
	Implemented user-friendly navigation features in the online catalog (ex. recommendation lists)	1 of 6	17%
	No changes were made to the bibliographic records	1 of 6	17%
	Improved the readability of catalog descriptions for accessibility	0 of 6	0%
	Other	0 of 6	0%
Moderately Effective (12)	No changes were made to the bibliographic records	8 of 12	67%
	Enhanced the searchability of diverse materials in the catalog (ex. patron-generated tagging)	3 of 12	25%
	Created more inclusive keywords and/or subject headings using Library of Congress Subject Headings (LCSH)	2 of 12	20%
	Updated MARC records to reflect diverse and inclusive content (reassessing the existing records	2 of 12	17%
	Implemented user-friendly navigation features in the online catalog (ex. recommendation lists)	0 of 12	17%
	Improved the readability of catalog descriptions for accessibility	0 of 12	0%
	Other	0 of 12	0%
Somewhat Ineffective (3)	No changes were made to the bibliographic records	1 of 3	33%
	Other	1 of 3	33%
	Updated MARC records to reflect diverse and inclusive content (reassessing the existing records)	1 of 3	33%
	Created more inclusive keywords and/or subject headings using Library of Congress Subject Headings (LCSH)	0 of 3	0%
	Enhanced the searchability of diverse materials in the catalog (ex. patron-generated tagging)	0 of 3	0%
	Implemented user-friendly navigation features in the online catalog (ex. recommendation lists)	0 of 3	0%
	Improved the readability of catalog descriptions for accessibility	0 of 3	0%
Very Ineffective (5)	No changes were made to the bibliographic records	4 of 5	80%
	Other	1 of 5	20%
	Created more inclusive keywords and/or subject headings using Library of Congress Subject Headings (LCSH)	0 of 5	0%
	Enhanced the searchability of diverse materials in the catalog (ex. patron-generated tagging)	0 of 5	0%
	Implemented user-friendly navigation features in the online catalog (ex. recommendation lists)	0 of 5	0%
	Improved the readability of catalog descriptions for accessibility	0 of 5	0%
	Updated MARC records to reflect diverse and inclusive content (reassessing the existing records)	0 of 5	0%

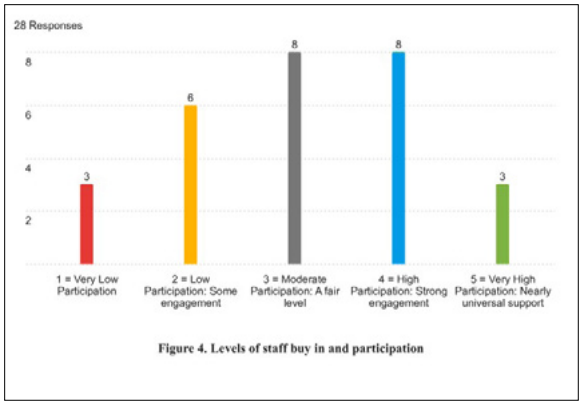


Figure 4. Levels of staff buy in and participation

The next survey question asked the remaining twenty-eight participants to rate the level of "staff-buy-in and participation" in making descriptive cataloging changes. Overall, the outlook was positive since nineteen (69 percent) of the twenty-eight participants assessed their library as "moderate" (n=8; 29 percent), "high" (n=8; 29 percent), or "very high" (n=3;11 percent) for participation level. This indicated a high level of support for institution-wide diversity and inclusion goals, which Bledsoe et al. deemed essential to success.

In their article, Bledsoe et al. also emphasized the significance of the "reframing method" of diversity audit.[61] With this in mind, a comparative analysis was conducted to see if there was a connection between participation levels and audit methods. Interestingly, out of the three participants who scored "very high" in participation from figure 4, two-thirds (n=2/3; 67 percent) used the "reframing method." Despite the very limited sample size, it may be beneficial to further explore integrating both the "reframing method" and the "catalog search method" into a strategic plan for critical cataloging.

Resource and Staffing Limitations Impede Critical Cataloging

We then addressed common challenges librarians encountered when integrating new cataloging practices—which could have an effect on staff engagement. The data showed that "limited time and staff members" were a recurring obstacle to making successful collection and catalog changes. This was confirmed when 45 percent (n=14/31) of the thirty-one participants chose "limited staff resources or time" as a challenge in the last survey question (table 7).

Table 7. Challenges encountered when integrating critical cataloging practices

31 Responses

Challenges Faced		Choice Count
Limited staff resources or time	45%	14
Insufficient training on diversity and inclusion practices	19%	6
Resistance or lack of buy-in from staff	6%	2
Accurately and respectfully identifying or choosing descriptive terms for diverse materials	39%	12
Technical limitations of the catalog system	10%	3
Level of interoperability: lack of compatibility with other organizations or management systems	3%	1
Lack of clear standards or guidelines for diverse cataloging	6%	2
Did not implement critical cataloging practices	35%	11
Other	13%	4
Total		31

Surprisingly, the "level of interoperability" was marked as a challenge to only one librarian's organization (n=1/31; 3 percent). The choice "technical limitations of the catalog"—marked by three participants (10 percent)—could be interpreted as encompassing interoperability issues; however, based on the literature we reviewed, interoperability was hypothesized to be a more significant issue.

Table 8. Comparative analysis of critical cataloging practices vs. challenges encountered

Critical Cataloging Practices (Total Participant Count)	Challenges Encountered	Count	Percent (Count / Total Participant Count)
Yes (14)	Limited staff resources or time	8 of 14	57%
	Accurately and respectfully identifying or choosing descriptive terms for diverse materials	8 of 14	57%
	Insufficient training on diversity and inclusion practices	3 of 14	21%
	Technical limitations of the catalog system	2 of 14	14%
	Lack of clear standards or guidelines for diverse cataloging	2 of 14	14%
	Did not implement critical cataloging practices	2 of 14	14%
	Other	1 of 14	7%
	Level of interoperability	1 of 14	7%
	Resistance or lack of buy-in from staff	0 of 14	★ 0%
Unsure (10)	Limited staff resources or time	5 of 10	50%
	Other	3 of 10	30%
	Did not implement critical cataloging practices	3 of 10	30%
	Accurately and respectfully identifying or choosing descriptive terms for diverse materials	2 of 10	20%
	Technical limitations of the catalog system	1 of 10	10%
	Resistance or lack of buy-in from staff	1 of 10	10%
	Insufficient training on diversity and inclusion practices	1 of 10	10%
	Level of interoperability	0 of 10	0%
	Lack of clear standards or guidelines for diverse cataloging	0 of 10	0%
No (7)	Did not implement critical cataloging practices	6 of 7	86%
	Insufficient training on diversity and inclusion practices	2 of 7	29%
	Accurately and respectfully identifying or choosing descriptive terms for diverse materials	2 of 7	29%
	Resistance or lack of buy-in from staff	1 of 7	14%
	Limited staff resources or time	1 of 7	14%
	Technical limitations of the catalog system	0 of 7	0%
	Other	0 of 7	0%
	Level of interoperability	0 of 7	0%
	Lack of clear standards or guidelines for diverse cataloging	0 of 7	0%

To see the main challenge for those who critically cataloged, we did a comparative analysis of "adopting critical cataloging" and "challenges encountered." Table 8 lists each group of respondents ("Yes," "No," "Unsure"), the challenges they encountered, and the percentage of that group who faced each challenge. We found that the participants responding "Yes" found "accurately and respectfully identifying or choosing descriptive terms" a significant obstacle. As seen in table 8, 57 percent of the

fourteen "Yes" participants (n=8/14) marked this as a challenge—the same amount as those who found "limited staff or time" to be an obstacle.

However, the most notable finding was that none of the fourteen participants who responded "Yes" reported "facing resistance or a lack of staff buy-in" (n=0/14). This indicates that the diversity audit *and* subsequent critical cataloging changes must be an institution-wide initiative and must be accepted as integral to the library's diversity and inclusion goals to be truly effective.

Discussion

Results revealed that there are several key variables that make the integration of critical cataloging into diversity audit procedures a success, as discussed below.

Foundations of Inclusive Library Practices

The first and arguably the most critical factor was that librarians who acknowledged diversity audits as a foundational step, not an isolated endeavor, were more likely to continue building inclusive collections by addressing and rectifying biases in the OPAC metadata. Looking at survey responses, it was apparent that this goal is also deeply intertwined with institution-wide engagement and participation—where a collaborative effort between staff, departments, administration, partnering libraries, and the community is required for meaningful changes. In this way, diversity and inclusion initiatives become ingrained and accepted into the library's collection development, management, and cataloging policies.

Audit Methodology Matters

Another variable of note was that the chosen audit method significantly impacts the success of critical cataloging. Results showed that the type or combination of diversity audits performed greatly influenced the library's transition to addressing the descriptive data in bibliographic records. Those librarians who reported that their library valued critical cataloging guidelines were more likely to employ a diversity audit method that incorporated the metadata of the physical collection, not just a hands-on inspection. When looking at the data, these libraries also had a higher report of using the "catalog search method" in combination with the "book inspection method."

Even more significant was the fact that librarians who rated their libraries highly for "successful integration of critical cataloging" and "staff buy-in" were more likely to use the "reframing method" in conjunction with the other approaches. These libraries emphasized starting with metadata, as this strategy was theorized to streamline the process of enhancing catalog accessibility by enabling simultaneous adjustments to bibliographic data during the diversity audit.

Focus on Youth Collections

The results showed a potential link between auditing children or young adult sections and using critical cataloging practices. Although the survey did not inquire further into this connection, several reasons

could explain this: (1) the growing awareness of the need for diverse and inclusive resources for young readers; (2) the influence of educational institutions' prioritization of diversity and inclusion possibly extending to public libraries; (3) the typically high-circulation rates associated with these collections; and/or (4) the relatively recent trend toward greater diversity in publications by authors, publishers, and advocacy groups. However, further research is necessary to accurately determine the relationship between audits of children/young adult sections and the adoption of critical cataloging practices.

Community Representation Is Necessary

Participants showed that the primary objective of a diversity audit is to develop a collection that accurately represents the patron population. Similarly, this should also be the aim of cataloging practices. The results demonstrated that direct consultation with the community was essential at each step of the diversity and inclusion initiative to achieve this goal. How the library incorporated feedback differed, but those who successfully integrated inclusive descriptive terms made sure to receive feedback from their patrons, staff, and other stakeholders—which indicated that this is an important variable to consider. Suggestions for how to do this can be found in this study's data, such as conducting regular community forums and personal interactions; additionally, other articles specifically on this topic could provide further advice for this stage of the plan.

Interestingly, exploring the role of library-specific factors on critical cataloging practices showed no significant relationship between the library's characteristics or demographics and the occurrence of diversity audits and cataloging changes. In particular, the "overall diversity" and "socioeconomic status" of the population were predicted to be a major influence on a library's motivations and strategies. This expectation was based on the belief that libraries strive to represent their communities accurately, leading to the assumption that more diverse institutions would be more likely to conduct audits to address representation gaps.

Contrary to our prediction, the majority of our responding librarians who completed both processes represented suburban (n=8/11; 73 percent), moderately diverse (n=4/11; 36 percent), and high-income (n=4/11; 36 percent) public libraries. This pattern could be associated with these libraries having greater access to resources such as funding, staffing, and community involvement—which helps facilitate the implementation of diversity audits and cataloging changes. Simply put, an effective strategy for one library does not guarantee that another similar library will find the same success. Although it is beneficial for librarians to review how other libraries tackled this issue, it is crucial that the cataloging framework be tailored to the unique contexts of individual institutions.

Ongoing Process

A reoccurring theme found in our results and within relevant literature was that critical cataloging must be an ongoing process requiring continuous improvement. Libraries must wholeheartedly agree to evolve and adapt these guidelines along with their community's changing needs. Resources from relevant documents, such as the *Inclusive Cataloging: Histories, Context, and Reparative Approaches;*

Cataloguing Code of Ethics; *Core Competencies for Cataloging and Metadata Professional Librarians;* CatalogingLab; and other social justice institutions are also invaluable to this endeavor.[62]

As many articles have noted, this would first require that libraries become aware of these resources and documents. The large portion of "Unsure" respondents to the initial questions regarding diversity audits and critical cataloging demonstrated a lack of awareness of these processes. Evans et al. suggest that institutions that want to advertise these diversity and inclusion efforts should refer to groups like the Cataloging Ethics Steering Committee, which "has provided a model for raising awareness of professional documents."[63]

Broad Inclusion of Research Participants

Our study was exploratory in nature, and to narrow it down, we wanted to focus on librarians who conducted an audit to see if there were common variables between those who made cataloging changes. However, results showed that the librarians who marked "Unsure" for the participation requirements provided an enhanced understanding of the collection management and cataloging practices already being implemented, which was not expected. This broader inclusion aided in the overall interpretation of audit results. When conducting similar research in the future, we recommend including a wider range of perspectives from research participants. For example, a future study might include those who had not done a diversity audit for comparison.

There was also a high open-response rate to the survey inquiry (n=171), and other types of librarians (metadata, academic, and school) directly expressed their interest in viewing the final results by emailing or messaging us. In future iterations, it may be beneficial to open the survey to librarians of other institutions, such as school librarians, since they could provide valuable perspectives and recommendations that can be applied to public libraries.

Considering the Current Political Climate

Since the conclusion of our study in March 2024, the broader debate over diversity and inclusion initiatives became polarized. In January 2025, an executive order targeting diversity and inclusion policies in educational institutions brought the debate to the federal level, influencing discussions on library practices as well.[64] Supporters of diversity and inclusion efforts argue that they promote fairness and inclusion, whereas critics believe they push certain beliefs and disrupt established practices.

Libraries implementing diversity audits and critical cataloging may face resistance from local governments, administration, patrons, or stakeholders who oppose diversity and inclusion–driven changes. This opposition can take the form of budget cuts, staff restructuring, reduced community support, and/or direct political intervention. Given that our study found community involvement as essential to the success of critical cataloging, the absence of such support can significantly hinder or stop these efforts.

Despite these challenges, the ALA asserts that "equity, diversity, and inclusion are central to the promotion and practice of intellectual freedom."[65] Professional committees, strong advocacy groups,

and resources, such as *Equity, Diversity, Inclusion: An Interpretation of the Library Bill of Rights and Advocacy Assistance*, can provide support and guidance for librarians navigating policy shifts and external pressures.[66] These tools reinforce the long-term value of diversity and inclusion efforts and offer strategies to uphold inclusive library services.

Limitations

The survey response rate and sample size may have an impact on the findings. Although the survey attracted 171 participants, there was a smaller than expected sub-sample of librarians who had completed a diversity audit ("Yes," n=35; "Unsure," n=27). This, along with a considerable portion of "Unsure" responses, suggested that awareness of diversity audits and critical cataloging might not be as widespread as initially thought. This could also be interpreted as evidence of self-selection bias, as the poll was not representative of all librarians; rather, it may have drawn participants who were already interested in or involved in critical cataloging practices and diversity and inclusion projects.

Another limitation was the absence of a question regarding when the diversity audit and cataloging changes were completed, making it unclear whether these practices were driven by recent diversity and inclusion trends or were long-standing efforts. Comparing library practices before formal diversity and inclusion frameworks, during their widespread adoption, and in the current climate could clarify how libraries balance community needs with shifting policies over time.

The survey's anonymous nature also prevented us from confirming that respondents represented different libraries, reducing the generalizability of the findings. To address these limitations, further studies should expand survey distribution, improve follow-up strategies, and include participants from other states. Although this report focused solely on Connecticut public libraries, a broader nationwide analysis is needed to fully understand critical cataloging practices across different regions and library systems.

Conclusion

Future research must examine how critical cataloging can be successfully implemented, emphasizing effective diversity audit methods, accurate descriptive terms, and meaningful community feedback. Meanwhile, libraries are urged to take proactive measures by continuously updating their bibliographic records to remain aligned with the evolving demographics and needs of their patrons. This is essential to fulfilling their commitment to inclusivity and diversity, which extends beyond mere diverse representation in books. It is about fostering a sense of belonging and encouraging active engagement with collections that accurately mirror the identities of their patrons. For this reason, adopting critical cataloging practices post diversity audit becomes vital, for it is ultimately your community's connection to your collection.

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Appendix A

Data Gathering Materials:

Collection to Cataloging Connection Research Survey

Study Title: Adopting Critical Cataloging Practices Post-Diversity Audit: It's Your Community's Connection to Your Collection **[IRB Protocol #1045]**

Introduction

Welcome and thank you for participating in this survey. Your responses will contribute valuable insights into the impact of diversity audits on catalog accessibility and library practices. This survey is anonymous, and all information provided will be treated with confidentiality. You may skip questions and exit out of the survey at any time.

Informed Consent

Qualtrics setting: Forced Response

Qualtrics Option: Display Participant Consent Form

Download Option: **Participant Consent Form**

- □ I consent
- □ I do not consent *Skip Logic: display Concluding Message if 2nd option is chosen

Participation Requirements

***Qualtrics setting: Forced Response for Q1-3**

1. Are you employed as a librarian at a Connecticut public library? (or previously)
   - □ Yes
   - □ No

Qualtrics termination response for "No": Thank you for your interest in this study, but participants must work, or have worked, at a public library in Connecticut that has conducted a diversity audit *Skip Logic: display Concluding Message if "no" is chosen.

2. Has your library conducted a diversity audit?
   - □ Yes
   - □ Unsure
   - □ No

Qualtrics termination response for "No": Thank you for your interest, but this study is targeting CT public libraries who have completed a diversity audit *Skip Logic: display Concluding Message if "no" is chosen.

[Diversity audit definition note: analyzing the representation and inclusiveness of the library's books and resources to make sure they include a wide range of stories, perspective, experiences, and identities. Note: This could be a partial audit (ex. only Children's section)]

3. Has your library adopted critical cataloging practices as a result of the diversity audit? [Critical cataloging definition note: method in library cataloging that addresses and aims to correct biases and inequalities in how resources are organized and described (ex. subject headings, keywords)]

- □ Yes
- □ No
- □ Unsure

Qualtrics Added Note for #3: Even if your response is "No" for #3, we value your participation in this survey. Please continue with the questions relevant to your library's diversity audit process. Feel free to skip any questions that do not apply to your situation. Your insights are important to us.

Questionnaire

***Qualtrics setting: Allow for No Response**

Library Classification by Geographic Setting and Size:

Please select the option that best describes your library's geographic setting and the relative size of the population it serves. This classification will help us understand the context and scale of your library operations.

1. Geographic Setting: (Select one)
   - □ Rural
   - □ Suburban
   - □ Urban
2. Estimated Population Size Served: (Select one within your geographic setting)
   - □ Small (serving a population size at the lower end typical for this setting)
   - □ Medium (serving a population size at the mid-range typical for this setting)
   - □ Large (serving a population size at the higher end typical for this setting)

Example Selection: [ ] Urban - Medium

3. Select the option(s) that best describe your library:
   - □ Independent library

- □ Multi-branch system
- □ Member of a consortium

General Patron Demographics:

Based on your observation and experience, please select the options that best describe the overall demographics of your library's patrons. This question aims to capture a broad understanding of your library community.

1. Overall Diversity (Select One):
   - □ Highly diverse
   - □ Moderately diverse
   - □ Slightly diverse Not diverse
2. Socioeconomic Status (Select One):
   - □ Low income
   - □ Middle income
   - □ High income
   - □ Mixed income levels

Diversity Audit Process:

To understand the motivations and criteria guiding libraries to enhance metadata accessibility post-diversity audit, please select the audit methods you have used.

1. Audit Method Used (select all that apply):
   - □ Catalog Search Method: Analyzing catalog data for diverse titles/authors based on specific themes, subjects, or backgrounds.
   - □ Checklist Method: Utilizing a diversity checklist to review each collection item's representation of various criteria.
   - □ Book Inspection Method: Conducting hands-on reviews of books to assess the diversity of content, characters, and authorship.
   - □ Reverse Diversity Audit: Identifying gaps by checking for the presence of specific diverse titles or authors in the collection.
   - □ Sampling: Evaluating random samples from the collection to gain insights into its overall diversity, suitable for large collections.

- □ Vendor-Assisted Audit: Employing a third-party vendor to conduct the diversity audit, leveraging their expertise and resources for a comprehensive analysis.
- □ Reframing Method: Applying new descriptions to the existing materials (ex. patron-generated tagging, inclusive keywords/subject headings
- □ Other _____

2. Please indicate which sections of your library's collection were included in the diversity audit. (Select all that apply):
   - □ Entire Collection
   - □ Adult Collection Children's Collection
   - □ Young Adult Collection
   - □ Fiction Collection
   - □ Non-Fiction Collection
   - □ Reference Collection
   - □ Other _____
3. How did you promote your diverse collection after the audit? (Select all that apply.)
   - □ Physical displays in prominent areas
   - □ Social media campaigns (e.g., Twitter, Instagram, Facebook)
   - □ Changes to OPAC (Online Public Access Catalog) data to highlight diverse materials
   - □ Email newsletters to library patrons
   - □ Collaboration with local community groups or organizations
   - □ Virtual events or webinars
   - □ Press releases or local media outreach
   - □ Staff training to encourage direct patron recommendations
   - □ Incorporation into existing or new library programs (e.g., book clubs, story times)
   - □ None
   - □ Other _____

Catalog Accessibility & Inclusive Cataloging Post-Audit:

Please indicate post-audit actions taken to improve catalog accessibility and inclusivity. Your input aids in assessing the connection between diversity audits and cataloging practices.

1. Did you make any improvements to catalog accessibility as a result of the audit? (Select all that apply.)

   - □ Created more inclusive keywords and/or subject headings using Library of Congress Subject Headings (LCSH) and/or Sears List of Subject Headings
   - □ Enhanced the searchability of diverse materials in the catalog (ex. additional keywords, patron-generated tagging)
   - □ Implemented user-friendly navigation features in the online catalog (ex. recommendation lists)
   - □ Improved the readability of catalog descriptions for accessibility
   - □ Updated MARC records to reflect diverse and inclusive content (reassessing the existing records – all or portions)
   - □ No changes were made to bibliographic records. Other _____

2. What standards or criteria were used to evaluate the subject headings, keywords, tags, and other descriptives in the MARC records? (Select all that apply.)

   - □ *Cataloguing Code of Ethics*
   - □ Authorized Knowledge Organization Systems, such as Library of Congress Subject Headings (LCSH)/Sears List
   - □ Resource Description and Access (RDA)
   - □ Own institution's inclusivity guidelines
   - □ Feedback from community members or library users
   - □ Author-generated subject headings and keywords
   - □ Vendor-provided subject headings and keywords
   - □ Guidelines from professional library associations (e.g., ALA, IFLA)
   - □ Critical cataloging practices or frameworks
   - □ None
   - □ Other _____

3. What were the main reasons for undertaking new inclusive cataloging practices? (Select all that apply.)

- □ To better reflect the diversity of our community
- □ To enhance the discoverability of diverse materials
- □ To address and rectify biases in existing cataloging practices
- □ To comply with updated institutional or professional standards
- □ To support academic research and education on diversity and inclusion
- □ To respond to feedback from library users
- □ Critical cataloging practices were not implemented
- □ Other _____

Feedback and Engagement:

Even if your library has faced challenges in collecting feedback or engaging staff in the audit process, your experiences offer important insights into the diversity and inclusivity of library collections and services.

1. What methods your library uses to collect user feedback on the catalog and diversity of the collection (check all that apply):
   - □ Online surveys
   - □ Feedback forms available in the library
   - □ Social media engagement
   - □ Focus groups or community meetings.
   - □ Direct email feedback
   - □ None
   - □ Other _____
2. Please assess the success of integrating critical cataloging practices following the diversity audit within your library on a scale from 1 to 5.
   - □ 1 = Very Ineffective: Significant challenges with implementation and acceptance of new practices.
   - □ 2 = Somewhat Ineffective: Some efforts at integration, but with notable resistance or lack of effective adoption.
   - □ 3 = Moderately Effective: A fair level of successful integration, with a mix of effective adoption and some challenges.

- □ 4 = Highly Effective: Strong adoption and integration of critical cataloging practices with widespread support.
- □ 5 = Very Highly Effective: Nearly universal adoption and effective integration of new practices across the library.

3. Please rate the level of staff buy-in and participation in the adoption of the critical cataloging process on a scale from 1 to 5.
   - □ 1 = Very Low Participation: Significant challenges with staff engagement and support.
   - □ 2 = Low Participation: Some engagement, but with notable resistance or lack of interest.
   - □ 3 = Moderate Participation: A fair level of participation, with a balance of support and resistance.
   - □ 4 = High Participation: Strong engagement and support from most staff members.
   - □ 5 = Very High Participation: Nearly universal support and active participation from staff.

Challenges:

Sharing the challenges and obstacles encountered during/after your library's diversity audit is invaluable to our study. It helps us understand the complexities of implementing these audits and subsequent metadata changes, as well as the support needed for success.

1. What challenges or obstacles did you encounter during/after the diversity audit when trying to implement critical cataloging practices? (select all that apply)
   - □ Limited staff resources or time
   - □ Insufficient training on diversity and inclusion practices
   - □ Resistance or lack of buy-in from staff
   - □ Accurately and respectfully identifying or choosing descriptive terms for diverse materials
   - □ Technical limitations of the catalog system
   - □ Level of Interoperability: lack of compatibility with other organizations and/or library management systems
   - □ Lack of clear standards or guidelines for diverse cataloging
   - □ Did not implement critical cataloging practices.
   - □ Other _____

Short Response Questions

***Qualtrics setting: Allow for No Response**

This section is dedicated to gathering in-depth insights into your library's choice to critically analyze OPAC metadata post-diversity audit. Your responses to these three short response questions will greatly enhance our understanding of the motivations, decision-making processes, and challenges encountered during this initiative. Thank you!

1. **Motivation and Goals:** Please share your motivation and goals for conducting a diversity audit and making subsequent changes to bibliographic records.

Response: _____

2. **Criteria for Catalog Evaluation:** What key factors guided the selection of evaluative criteria for cataloging library materials? Why were these factors important to your library?

Response: _____

3. **Challenges in Metadata Implementation:** Can you describe any challenges you faced in implementing changes to the OPAC metadata? How did you overcome these obstacles?

Response: _____

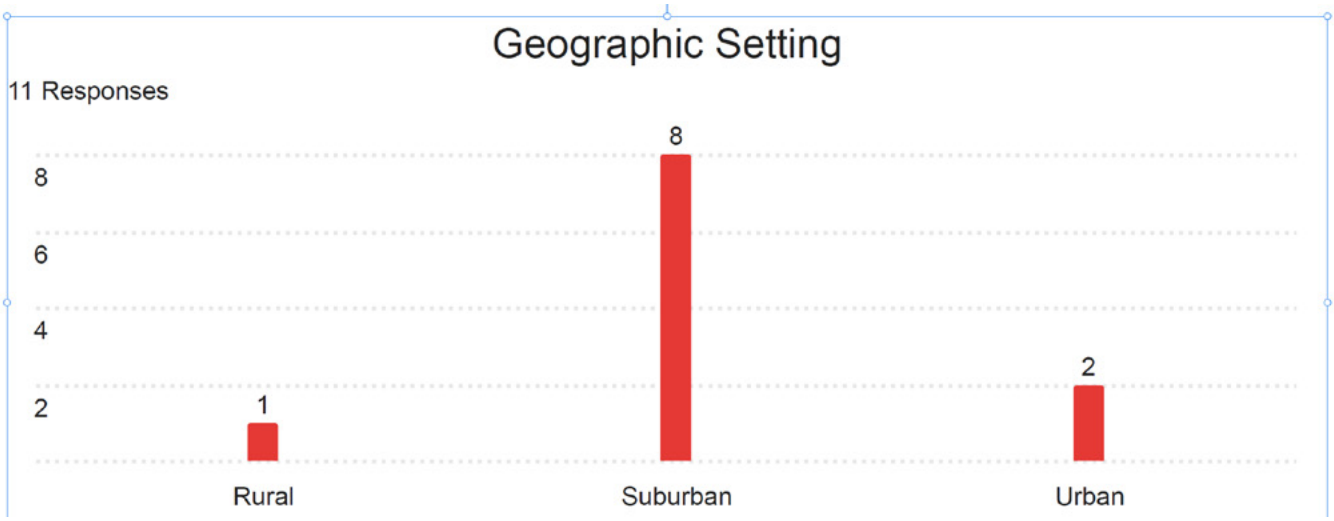
Survey Conclusion Message

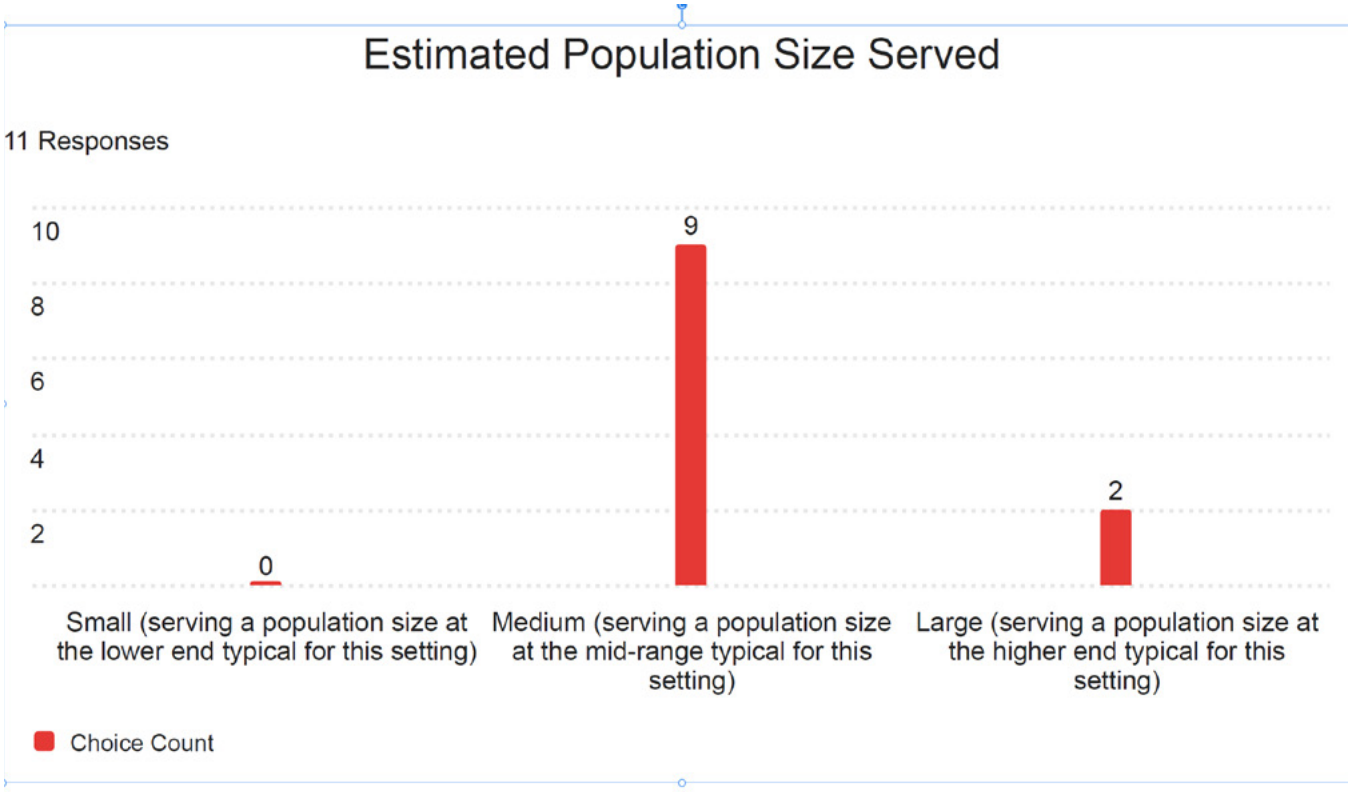
[Qualtrics Option Chosen: provide a summary of responses]

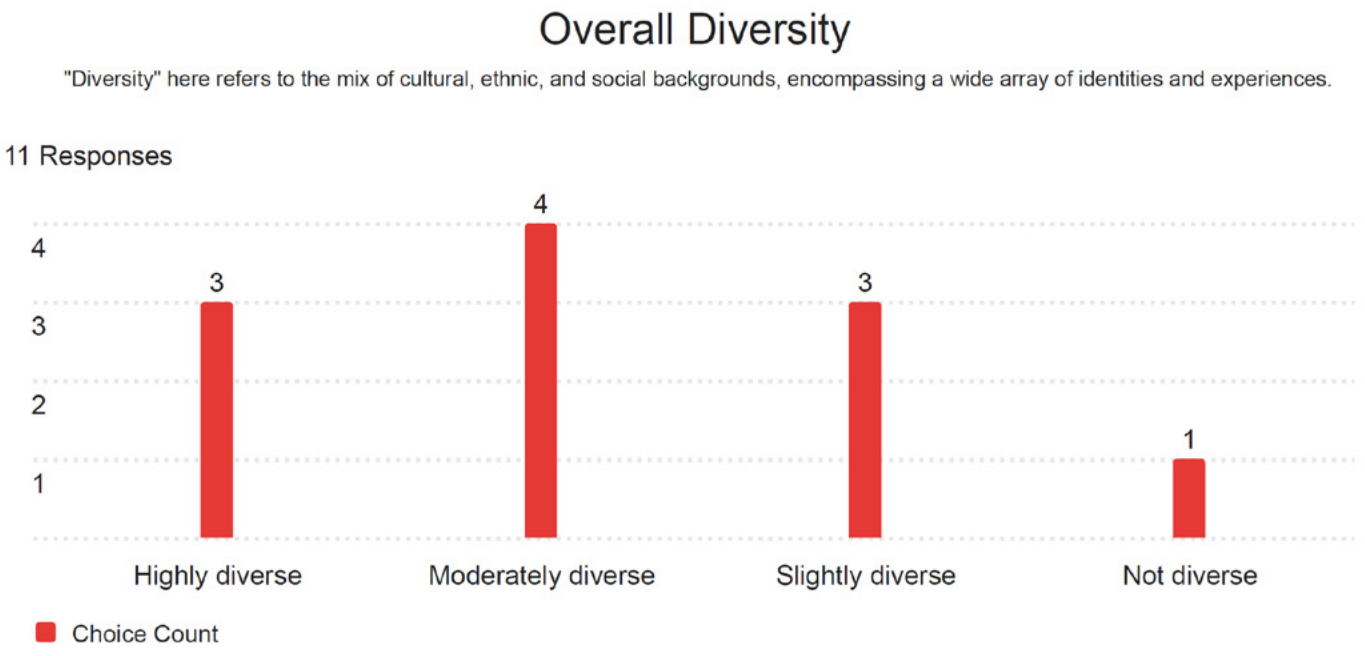
Thank you for your time and valuable input! Your participation is instrumental in enhancing our understanding of the connection between diversity audits and critical cataloging in library practices.

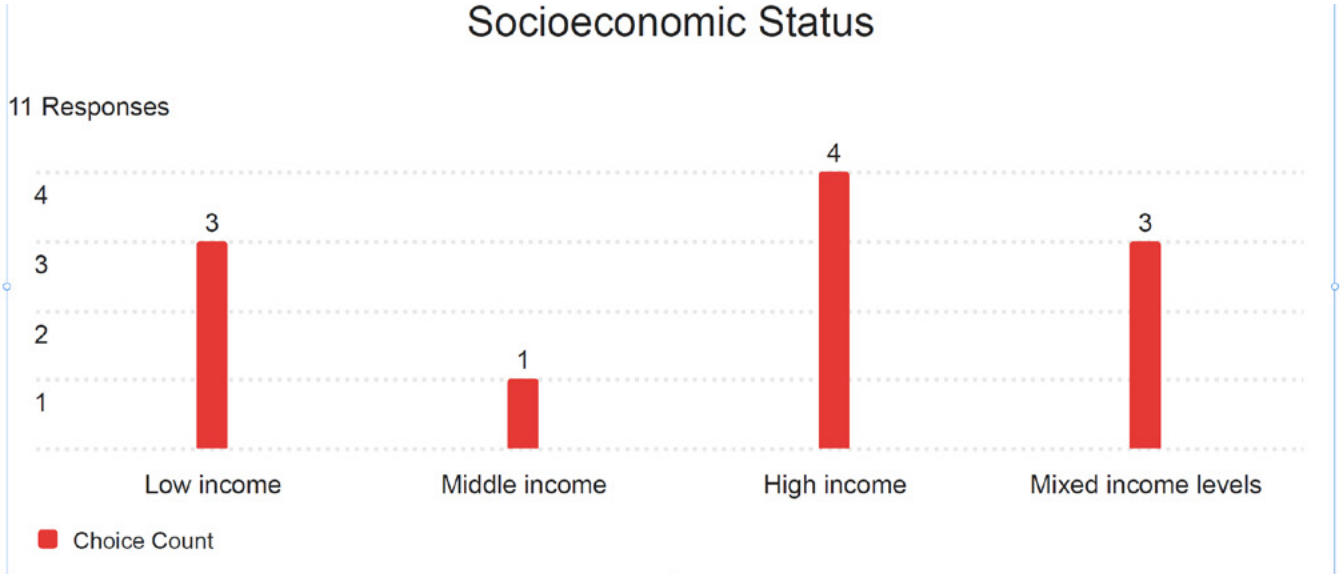
Appendix B

Responses for Participants Who Marked 'YES' to Conducting an Audit and Adopting Critical Cataloging Practices






Overall Diversity
"Diversity" here refers to the mix of cultural, ethnic, and social backgrounds, encompassing a wide array of identities and experiences.
11 Responses
4
3
2
1
3
4
3
1
Highly diverse
Moderately diverse
Slightly diverse
Not diverse
Choice Count


Socioeconomic Status
11 Responses
4
3
2
1
3
1
4
3
Low income
Middle income
High income
Mixed income levels
Choice Count

Audit Method Used

select all that apply

10 Responses

Audit Method:		Choice Count
Catalog Search Method: Analyzing catalog data for diverse titles/authors based on specific themes, subjects, or backgrounds.	50%	5
Checklist Method: Utilizing a diversity checklist to review each collection item's representation of various criteria.	40%	4
Book Inspection Method: Conducting hands-on reviews of books to assess the diversity of content, characters, and authorship.	30%	3
Reverse Diversity Audit: Identifying gaps by checking for the presence of specific diverse titles or authors in the collection.	40%	4
Sampling: Evaluating random samples from the collection to gain insights into its overall diversity, suitable for large collections.	20%	2
Vendor-Assisted Audit: Employing a third-party vendor to conduct the diversity audit, leveraging their expertise and resources for a comprehensive analysis.	30%	3
Reframing Method: Applying new descriptions to the existing materials (ex. patron-generated tagging, inclusive keywords/subject headings)	30%	3
Other	0%	0
Total		10

Collection(s) Audit

select all that apply

11 Responses

Audit Method:		Choice Count
Entire Collection	27%	3
Adult Collection	36%	4
Children's Collection	36%	4
Young Adult Collection	36%	4
Fiction Collection	36%	4
Non-Fiction Collection	27%	3
Reference Collection	0%	0
Other	0%	0

Catalog Accessibility Improvements

select all that apply

11 Responses

Accessibility Changes:		Choice Count
Created more inclusive keywords and/or subject headings using Library of Congress Subject Headings (LCSH) and/or Sears List of Subject Headings	45%	5
Enhanced the searchability of diverse materials in the catalog (ex. additional keywords, patron-generated tagging)	55%	6
Implemented user-friendly navigation features in the online catalog (ex. recommendation lists)	9%	1
Improved the readability of catalog descriptions for accessibility	0%	0
Updated MARC records to reflect diverse and inclusive content (reassessing the existing records –all or portions)	36%	4
No changes were made to the bibliographic records	45%	5
Other	0%	0
Total		11

Standards Used To Evaluate MARC Records

select all that apply

10 Responses

Cataloging Standards:		Choice Count
Cataloguing Code of Ethics	20%	2
Authorized Knowledge Organization Systems, such as Library of Congress Subject Headings (LCSH)/Sears List	30%	3
Resource Description and Access (RDA)	10%	1
Own institution's inclusivity guidelines	60%	6
Feedback from community members or library users	60%	6
Author-generated subject headings and keywords	20%	2
Vendor-provided subject headings and keywords	30%	3
Guidelines from professional library associations (e.g., ALA, IFLA)	60%	6
Critical cataloging practices or frameworks	20%	2
None	0%	0
Other	0%	0
Total		10

Reasons For Adopting Critical Cataloging Practices

select all that apply

11 Responses

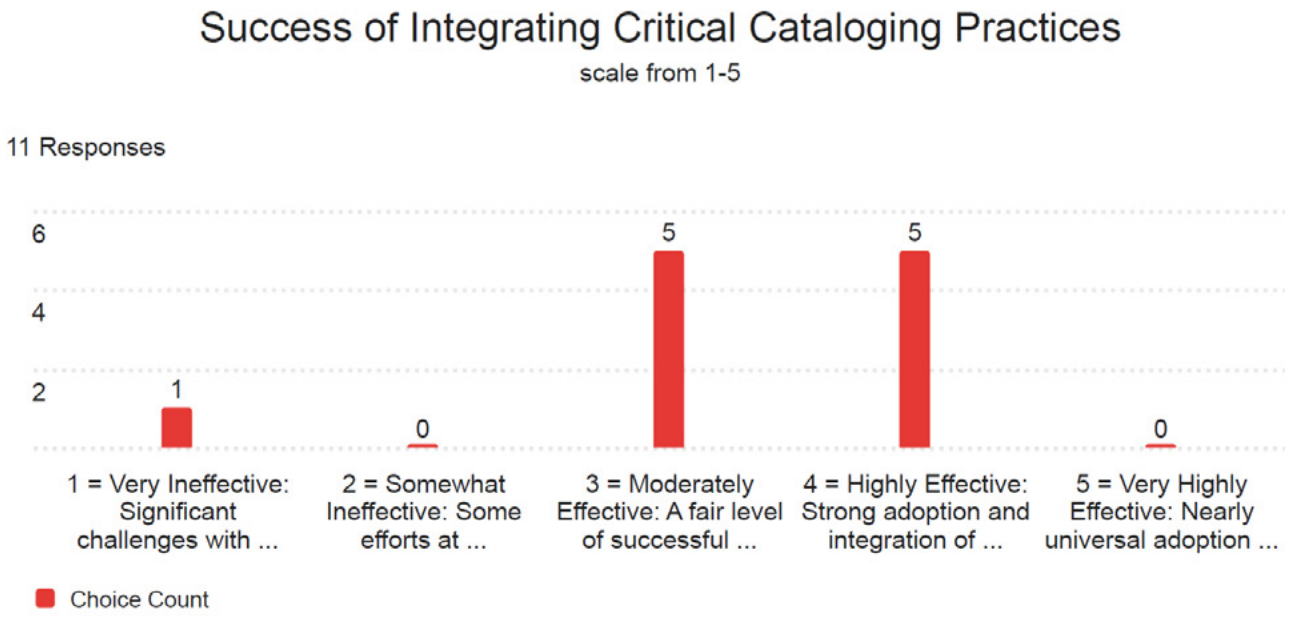
Motivation:		Choice Count
To better reflect the diversity of our community	64%	7
To enhance the discoverability of diverse materials	82%	9
To address and rectify biases in existing cataloging practices	73%	8
To comply with updated institutional or professional standards	45%	5
To support academic research and education on diversity and inclusion	18%	2
To respond to feedback from library users	27%	3
Critical cataloging practices were not implemented	0%	0
Other	0%	0
Total		11

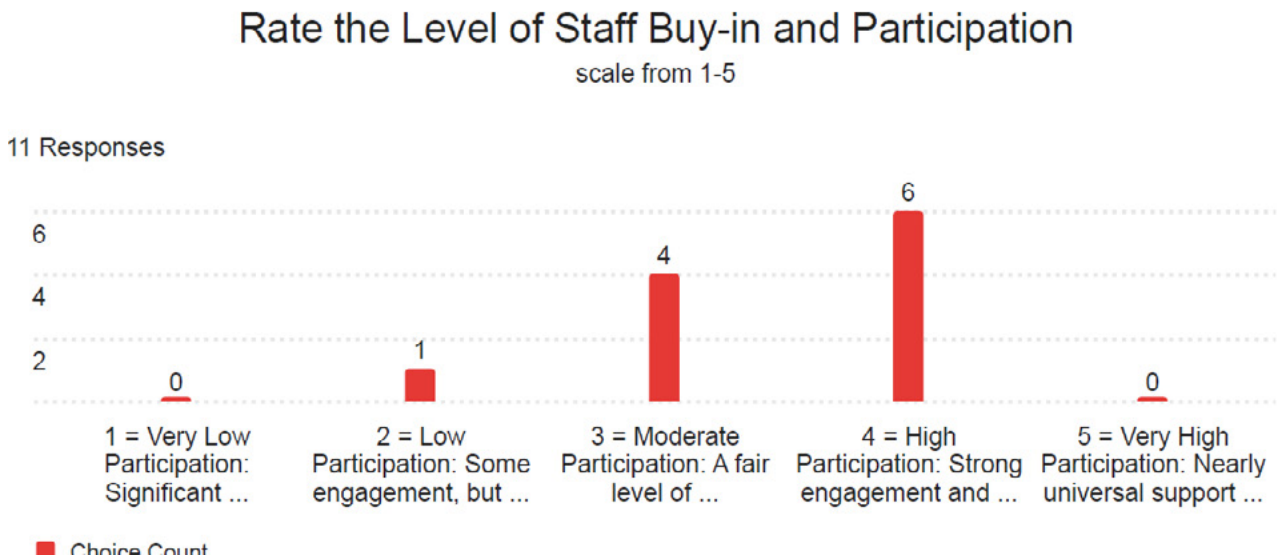
User Feedback Method(s)

select all that apply

10 Responses

Methods:		Choice Count
Online surveys	10%	1
Feedback forms available in the library	10%	1
Social media engagement	20%	2
Focus groups or community meetings	0%	0
Direct email feedback	10%	1
None	10%	1
Other	40%	4
Total		10


Success of Integrating Critical Cataloging Practices
scale from 1-5
11 Responses
6
4
2
1
0
5
5
0
1 = Very Ineffective: Significant challenges with ...
2 = Somewhat Ineffective: Some efforts at ...
3 = Moderately Effective: A fair level of successful ...
4 = Highly Effective: Strong adoption and integration of ...
5 = Very Highly Effective: Nearly universal adoption ...
Choice Count


Rate the Level of Staff Buy-in and Participation
scale from 1-5
11 Responses
6
4
2
0
1
4
6
0
1 = Very Low Participation: Significant ...
2 = Low Participation: Some engagement, but ...
3 = Moderate Participation: A fair level of ...
4 = High Participation: Strong engagement and ...
5 = Very High Participation: Nearly universal support ...
Choice Count

Challenges Encountered

select all that apply

11 Responses

Challenges:		Choice Count
Limited staff resources or time	64%	7
Insufficient training on diversity and inclusion practices	82%	9
Resistance or lack of buy-in from staff	73%	8
Accurately and respectfully identifying or choosing descriptive terms for diverse materials	45%	5
Technical limitations of the catalog system	18%	2
Level of Interoperability: lack of compatibility with other organizations and/or library management systems	27%	3
Lack of clear standards or guidelines for diverse cataloging		
Did not implement critical cataloging practices	0%	0
Other	0%	0
Total		11

Correction: On July 9, 2025, the authors requested minor corrections to Appendix B including the removal of duplicated content.

NOTES ON OPERATIONS

Migrating Collections Materials Purchasing from a Legacy Payments Workflow to the Campus E-Procurement Platform

Gregory Ferguson

This article examines the experience of a large research library when it migrated its collections materials purchasing onto its university's outsourced e-procurement platform. Previously, the library used a homegrown legacy workflow to export invoice data directly from the integrated library system (ILS) to Accounts Payable to initiate payments to suppliers. Adopting the procurement platform has produced benefits for both the university and the library by bringing the library into alignment with standard campus workflows and improving visibility into collections materials spending. The move has also posed challenges for the library, which has had to adapt to new tasks in another system running parallel to its ongoing acquisitions work in the ILS. The article describes the legacy workflow, the campus platform, the migration project, and the library's continuing efforts to optimize its workflows to meet the campus platform's requirements while completing work in the ILS as efficiently as possible.

Since the last decade of the twentieth century, universities have increasingly adopted outsourced enterprise resource planning (ERP) systems and electronic procurement (e-procurement) platforms such as SAP, Oracle, Banner, and Jaggaer to manage a wide variety of functions, including accounting and purchasing. ERPs are used to "integrate and coordinate information" to help "manage company-wide business processes using a common database and shared management reporting tools."[1] E-procurement platforms perform a similar function specifically for purchasing workflows, usually with options for integrating with suppliers' systems.[2] Developers of ERPs and e-procurement platforms analyze their customers' common business functions and build "best practice" workflows to standardize those processes and complete them as efficiently as possible. These systems offer options for customization, but an organization adopting one typically finds that it needs to adapt at least some of its practices to fit the new software.[3] An organization may choose a single ERP to control all of its business processes, or it may select a combination of systems for specific functions and integrate them together.[4]

When an academic library adopts its institution's outsourced ERP or e-procurement platform for its collections materials purchasing, the new system can produce major changes within the library. This may be the case when moving for the first time to an outsourced system from a local legacy workflow or when moving from one outsourced system to another as part of an institution-wide migration. Despite the significance of these systems for library acquisitions workflows, they are rarely mentioned in library science literature. This article intends to help fill that gap by discussing the experience of New York University's (NYU) Bobst Library when it moved its collections materials purchasing from a legacy

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payments workflow to the university's outsourced e-procurement platform, Jaggaer, in 2022. Jaggaer (branded as "iBuy" at NYU) is integrated with the campus ERP, which together hold the university's purchasing and accounting functions. Using iBuy for collections materials purchasing has provided major benefits for the university and for the library by improving visibility into this part of the library's spending in the university's central systems. At the same time, iBuy has also posed challenges for the library by creating considerable new work on top of the acquisitions tasks that must still be completed in the integrated library system (ILS). More than two years after adopting iBuy for collections materials purchasing, Bobst continues to develop its workflows to meet iBuy's requirements and handle its work in the ILS as efficiently as possible.

Literature Review

Although there has been prolific publishing on the uses of ERPs and e-procurement platforms for business, literature is sparse on their applications in higher education generally and in academic libraries specifically. Rowland analyzed ERP adoptions at US universities and reported that 76 percent of PhD-granting institutions had implemented outsourced ERPs by 2006.[5] Previously, many universities handled their business processes with a combination of paper records and their own locally developed information technology (IT) infrastructure. This homegrown IT infrastructure was typically modified and re-modified over the years at each institution, making it increasingly difficult to maintain.[6] In the meantime, schools faced increasing requirements to demonstrate accountability to their funders and students, which in turn required timely and accurate data that their legacy workflows could not provide.[7] Adopting ERPs allowed universities to automate their financial processes, produce better reporting, and outsource the long-term design of complex IT infrastructure.[8] Rowland observed that adopting an ERP was an ongoing process of implementation (rather than a one-time act of installation) due to the fact that a new ERP's functionality rarely lined up perfectly with a university's existing practices.[9] Rowland proposed the concept of "fit-gap work" to understand a university's process of analyzing the gaps that appear between the ERP and previous workflows and then enacting solutions to fit the gaps. In some cases, the university was able to fit the gaps by customizing the ERP, whereas in other cases it had to adjust local procedures to match the ERP.[10] After these implementations, schools typically shifted support staff to higher-level work from previous tasks that were now automated, such as manual data entry and rote compliance monitoring. This allowed universities to provide additional value with the same staffing levels.[11]

Breeding observed in 2012 that an ILS can be thought of as an ERP for a library and identified the creation of interoperability between the financial functions of the ILS and the campus ERP as a major challenge for academic libraries. He envisioned a future in which developments in cloud computing, software-as-a-service (SaaS), and APIs could allow the ILS to function as a node of the campus ERP, rather than as a siloed separate system. Breeding saw these possibilities in the context of an ongoing trend toward outsourcing of university IT functions to reallocate resources to tasks that are closer to higher education's core mission.[12]

Brandshaug offered a case study of a library's adoption of an e-procurement system at the Norwegian University of Science and Technology (NTNU). In 2010, NTNU's library embarked on a project to migrate its collections materials purchasing into the university e-procurement platform, Basware. By 2013, the catalogs of two of the library's main suppliers for print materials were integrated directly with Basware. The library could use inventory data from the suppliers' websites to create purchase orders in Basware via a seamless workflow that also generated metadata to load into the ILS. At the time of writing in 2014, Brandshaug reported that print purchasing using the new workflow was very successful, although NTNU had not been able to integrate e-resources acquisitions due to gaps between the supplier's system and Basware.[13]

Seago described the University of Kentucky (UK) library system's integration between its ILS and ERP in the context of a project to overhaul its fund structure in Alma after migrating from Voyager in 2016. Changes to the fund structure were necessary to maintain the library's ability to export invoice data from the ILS to the campus ERP running on the SAP system. UK found that Alma's simpler fund structure could not accommodate all of the required data that had been contained in their Voyager fund architecture. Librarians adopted a combination of funds and reporting codes in Alma to help build a new integration for transmitting invoice data from Alma to the ERP.[14]

Midgley and Mundle reported that the University of Illinois at Chicago (UIC) faced a similar problem in their migration from Voyager to Alma in 2020. Like UK, UIC had implemented a workflow to export invoice data from their former ILS Voyager to the campus ERP Banner. UIC's workflow had relied on Voyager's reporting funds to provide data necessary for categorizing the transactions in Banner. When UIC migrated to Alma, the new system's simpler fund structure put this process in jeopardy. UIC also devised a new workflow using Alma's reporting codes, allowing them to maintain their integration with Banner while simplifying their fund structure in Alma.[15]

Institutional Context

NYU is a private, not-for-profit Carnegie R1 research university with its main campus in New York City and additional degree-granting campuses in Abu Dhabi and Shanghai. The university has a student body of more than 60,000 (split approximately evenly between undergraduates and graduate students) and employs more than 5,000 full-time faculty. NYU has an annual budget of $3.7 billion, excluding NYU Langone Health, which contains the School of Medicine and hospital system. NYU has libraries across all three campuses, with its main location, Elmer Holmes Bobst Library, situated on Washington Square in Manhattan. Bobst contains the system's central technical services office, known as Knowledge Access & Resource Management Services (KARMS). KARMS provides acquisitions and metadata services for the physical collections at Bobst, supports acquisitions and metadata activities at other libraries, and handles e-resources maintenance and systems administration for the entire system. Within KARMS, the Resource Management Department (RM) is responsible for acquisitions and participates with other departments in shared workflows for copy cataloging and e-resources maintenance. RM consists of one manager, four supervisors, sixteen full-time staff organized into

three units, and approximately twenty student workers. In NYU's fiscal year 2024, the department handled approximately 4,250 invoices for Bobst, 60,000 physical items, and 2,000 e-resources tasks such as activations, product audits, and troubleshooting requests. RM collaborates closely with Bobst's Collection Development Office and Office of Budget and Finance (Budget Office) on acquisitions processes. Bobst used Aleph as its ILS before migrating to Alma in January 2024. These systems will be referred to interchangeably as "the ILS" in this paper when the distinction between the two is not significant in relation to iBuy and its workflows.

The university's purchasing workflows are set by the central Procurement and Payables Office (P&P), whose mission is to oversee "the process of purchasing, receiving, paying for, and accounting for goods and services and managing travel & expense management."[16] Bobst interacts frequently with the Procurement and Accounts Payable (AP) units at P&P in relation to collections materials purchasing. Procurement facilitates purchasing processes from onboarding suppliers through ordering and receiving. AP makes payments for the goods and services obtained through Procurement's workflows. NYU's ERP runs on Oracle and is referred to locally as "FAME." FAME holds the university's general ledger and accounting functions. Purchasing processes are mostly carried out within a separate system outsourced to Jaggaer, a company specializing in e-procurement software. (Purchases made with university payment cards use a different outsourced platform and are the only exception to Jaggaer.) Jaggaer's platform is known as "iBuy" at NYU and is integrated with FAME to exchange data on a regular basis. Data from FAME is reported via the University Data Warehouse+ (UDW+), a reporting tool that runs on Oracle Business Intelligence. Units across campus can grant their staff appropriate permissions for iBuy and UDW+, although the university tightly controls access to FAME.

P&P provides a variety of workflows in iBuy for purchasing different types of goods and services. The details of different workflows will be described in more detail later on, but a general outline of the purchasing process is as follows: a unit (such as the library) creates a requisition (purchase request) in iBuy with a description of the purchase and a quote from the supplier. iBuy automatically routes the requisition for approval by the appropriate staff at Bobst and at Procurement as determined by the university's signature authority policy, which defines how spending authority is delegated. Once the requisition has been approved, iBuy creates an official university purchase order (PO) and emails it to the supplier. The funds necessary to pay for the purchase are encumbered on (committed to) the PO, which should typically be completed by the end of the fiscal year. After the goods or services have been delivered, the library confirms this in iBuy by entering a record of receipt on the PO. (Some purchases, such as subscription payments made in advance and small one-time POs, do not require receipts in iBuy.) The library then sends a PDF copy of the invoice with the PO number on it to an AP email alias. The PDF is ingested into the university's systems and attached to a voucher (a request for payment that AP can approve or reject). AP performs a three-way match on the invoice, which is a standard procurement process to confirm that the details on the invoice (1) match to an open PO (2) in the university's systems with the necessary record of receipt (3). If the invoice passes the three-way match, AP will approve its voucher to initiate payment. Data on the voucher (including the PDF invoice) is

ingested back into iBuy, allowing library staff to track its progress to payment and providing an easily accessible, long-term audit trail.

Legacy Workflow

From 2014 to 2021, Bobst and AP used homegrown automation (referred to hereafter as the "invoice export workflow") to pay most of Bobst's collections materials invoices using data from the ILS. In the invoice export workflow, the library was responsible for initiating its own ordering and payments without university POs and kept paper copies of its invoices as the official audit trail. RM carried out ordering, receiving, and invoicing workflows in the ILS, performed the three-way match using the paper invoice and the data in the ILS, and then routed the paper invoice to two staff members who specialized in payments processing. These two staff reviewed the paper invoice again against the ILS and then flagged the invoice in the ILS with a status indicating that it was ready for payment. A weekly job run by the library's systems administrator extracted a file of data from the ILS on the flagged invoices and delivered it securely to AP. AP uploaded the file into FAME to create vouchers that were processed for payment. RM filed the paper copy of the invoice after reconciling the payment data from FAME against the ILS. Bobst considered the invoice export workflow to be an improvement over the previous process, which had involved extensive manual work at the library and AP. The university had a procurement system called eReq at this time, but the library's collections materials purchasing bypassed its workflows. The 2015 edition of the campus procurement manual included language identifying library materials as an exception to standard purchasing practices.[17]

In 2016, the university replaced eReq with iBuy as its procurement platform containing all of its standard purchasing processes except payment cards. At that time, Bobst was allowed to keep the invoice export workflow and remain outside iBuy, in line with the language in the procurement manual. Over the following years, the library became very comfortable with the simplicity of the invoice export workflow. Figure 1 illustrates its efficiency for RM, where the steps to initiate payment for collections materials invoices proceeded in a straight line through the ILS' workflows and on to FAME. RM did perform a small amount of work in iBuy related to collections materials during this time. RM helped new vendors complete iBuy's onboarding process so that they would be registered in the university's systems as authorized suppliers who the library could do business with. RM also put a small number of requisitions into iBuy for collections materials that could not go through the invoice export workflow. At first, these consisted of purchases to be paid via wire transfer, for which PDF copies of the invoices were necessary to confirm the supplier's bank details. In 2020, RM began entering requisitions in iBuy for Amazon orders after P&P added Amazon as a "punchout" supplier whose inventory and workflows are integrated directly with iBuy. All told, however, purchases going through iBuy never added up to more than 5 percent of the invoices RM handled for Bobst during this period.

In early 2021, Bobst underwent a routine audit by the university's internal audit unit that included a review of its acquisitions workflows. The auditors' report in spring 2021 identified several drawbacks to the invoice export workflow and recommended that Bobst adopt iBuy for its collections materials

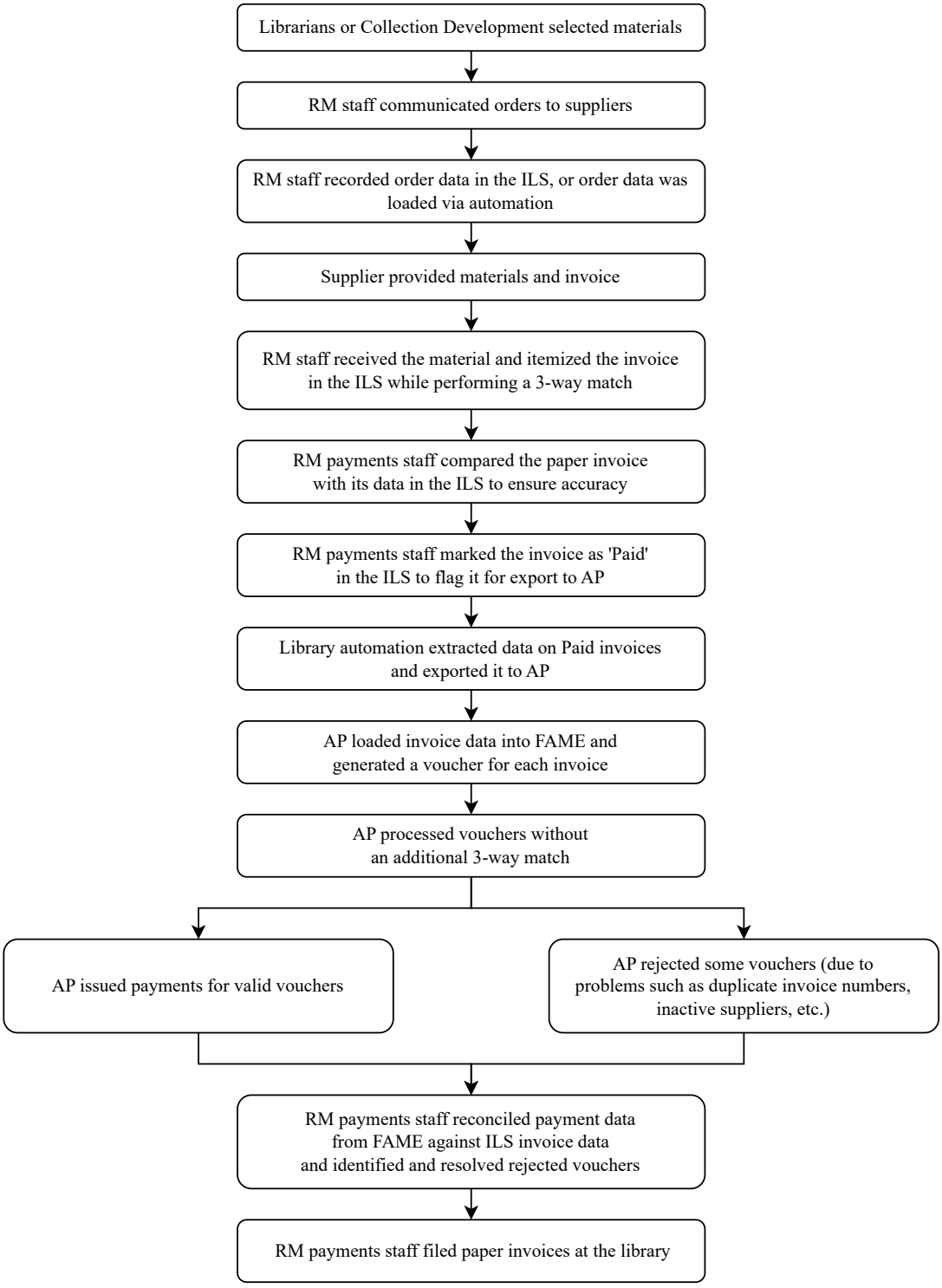

FIGURE 1. Invoice Export Workflow. This diagram depicts a purchase of one-time materials (such as books) where payment was made after receipt. Subscription purchases followed the same workflow, with the exception that material was supplied and received after payment.

purchasing, despite the carveout in the procurement manual. The report noted that the invoice data exported to AP included no record of who had authorized the spending, no metadata about what was purchased, and no copies of the actual invoices. Staff looking in the university's central systems FAME and UDW+ could see only the amounts that had been paid to each supplier for each invoice number, with no further details on any particular purchase. A full picture from ordering to payment could be obtained only by combining data from FAME/UDW+ with acquisitions data from the ILS and the paper files at the library, which only KARMS had easy access to. Adopting iBuy would make data on the library's collections materials purchasing visible to the staff inside and outside the library with the appropriate permissions, record which staff with spending authority had approved each order, and provide easy long-term access to digital copies of the invoices. Managers at the library were apprehensive about replacing a mission-critical workflow that had seemed to be functioning well with new processes that would require additional work from library staff. Despite those concerns, library managers also recognized that the opacity of the invoice export workflow made it untenable compared to the university's standard workflows and saw that the library itself would benefit from the increased visibility iBuy would provide. The library agreed to move to iBuy and embarked on a migration project with the goal of going live in January 2022.

Migration to iBuy

After the agreement to migrate was made, Bobst immediately assembled a team from RM, Collection Development, and the Budget Office (referred to collectively hereafter as "the library team") to begin the effort to overhaul the library's workflows in time to meet the January deadline. All three units recognized the urgent need to collaborate with each other and with P&P to adapt quickly to iBuy to avoid disruption to the library's collecting. In August 2021, the library team began meeting on a weekly basis, while also holding regular calls with P&P.

It was not obvious at the outset how Bobst should use iBuy for collections materials. The available documentation described general scenarios and did not provide the library team with a clear sense of how the platform's workflows could be applied to library-specific purchasing such as e-journal packages or approval plans. The team agreed that its most immediate task was to explain Bobst's different kinds of acquisitions to procurement managers so that they could provide appropriate recommendations. The team collaborated on a document that organized Bobst's acquisitions into eleven general categories based on criteria such as print versus electronic, monograph versus serial, and the frequency of the purchasing. Table 1 provides an overview of these eleven categories. The full document provided a concise description of each type of material, typical ordering and billing workflows, and representative examples of actual purchases. Knowing that Procurement would not be familiar with library acquisitions, the team took care to spell things out in plain language and avoid jargon. This document ensured that every type of purchasing was accounted for, helped Procurement assign each category to the appropriate iBuy workflow, and let the library team flag potential areas of concern for discussion.

Table 1. Categories of Collections Material Purchasing Presented to Procurement

Category	Characteristics	iBuy Workflow
One-time Print Purchases		
Approval plans and blanket orders	Suppliers select and ship books, scores, and A/V according to criteria provided by Bobst.	Standing order
Large firm order suppliers	Bobst orders books, scores and A/V one title at a time. Items ordered at different times are invoiced and shipped together as the supplier fulfills them.	Standing order
Small firm order suppliers	Occasional orders for titles not available from Bobst's usual print suppliers.	Non-Catalog
Special collections	Rare or unique materials such as antiquarian books and archival collections. Archival purchases have signed contracts, may be purchased from individuals, and/or may require payment over multiple years.	Non-Catalog or Bid Waiver
Print Continuations		
Standing orders for monographic series	Distinct from subscriptions in that invoices are sent with the materials and payment is made after receipt.	Standing Order
Library of Congress Cooperative Acquisitions Programs	One invoice annually for each of the library's memberships in programs to acquire material from regions of the world where it can otherwise be difficult to collect at a large scale. Payment is made in advance for the expected cost of the year's materials, including serials, books, and A/V.	Memberships/Subscriptions
Subscription agents	Serials subscriptions placed with suppliers who manage many orders for the customer with a variety of publishers. Payment is made in advance and materials are shipped from the publishers (not the agent).	Membership/Subscriptions
One-off serial subscriptions	Serials titles not available from subscription agents. Ordered directly from publishers. Payment is made in advance.	Memberships/Subscriptions form
Electronic Resources		
E-resource subscriptions	May be packages or single titles. May include perpetual access for new content issued during the time period covered by the invoice, or may simply provide access for the time period covered by the invoice. Licensed for all of NYU. Costs may be shared with other NYU libraries. Payment is made in advance.	Memberships/Subscriptions (except first-time orders, which use Non-Catalog or Bid Waiver POs)
E-book packages	Purchases to add new ebooks, typically from publishers who the library buys from regularly. Each purchase is for permanent access to a discrete set of standalone titles. May include multi-year agreements. Licensed for all of NYU. Costs may be shared with other NYU libraries.	Non-Catalog or Bid Waiver
One-time e-resource purchases	Purchases of standalone perpetual access e-resources such as video collections or newspaper archives. Licensed for all of NYU. Costs may be shared with other NYU libraries.	Non-Catalog or Bid Waiver

Note: This table summarizes the document describing the library's collections materials purchasing that the library team presented to Procurement during Bobst's migration to iBuy.

From October through December 2021, the library team met regularly with P&P to exchange information about their respective processes. Using the document, the library team described Bobst's

collections materials purchasing and answered questions from Procurement and AP managers. In turn, Procurement and AP outlined iBuy's standard workflows for submitting requisitions to be turned into POs, recording receipt of goods in iBuy, and submitting invoices to be matched and paid by AP. Procurement identified the best iBuy process for each type of purchasing in the document and took questions from the library team about workflow details.

After receiving this guidance from Procurement and AP, the library team spent November and December preparing to go live on iBuy in January. RM and Collection Development entered a small number of requisitions in iBuy while continuing to consult with Procurement, who were able to provide more nuanced instructions based on live examples. RM stopped shipments with Bobst's largest print suppliers (who generate the majority of its invoices) to give RM staff time to reconcile statements and make sure open invoices were paid via the invoice export workflow before December 31. This pause also provided time to obtain quotes from the same suppliers and enter requisitions for the POs that would be necessary to resume purchasing in iBuy.

Training staff and distributing assignments in the new system were major considerations in RM. The library team knew that ultimately many staff members in RM would need to be involved in handling the large volume of ordering, receiving, and invoicing work expected in iBuy. But during the migration project, the library team also knew that its understanding of the platform was still developing, while two of RM's three supervisor positions at the time happened to be vacant. With limited capacity to write documentation and deliver training, RM's manager and remaining supervisor decided on a temporary process retaining elements of the invoice export workflow. For this interim process, RM trained only the two staff members who were already familiar with the department's previous iBuy work in the new full set of procedures. After going live, the manager, supervisor, and these two employees were responsible for creating all requisitions. RM's receiving staff continued to receive and invoice material in the ILS first and then used Google Drive to route PDF copies of invoices to these employees, who recorded the necessary receipts in iBuy and emailed the invoices to AP. Restricting the number of staff working in iBuy was not a requirement of the system, which is intended to open up procurement work as broadly as possible[18]—but it was a crucial part of RM's successful launch on the platform. Keeping the structure of the staff assignments from the invoice export workflow minimized the early training burden, limited initial disruption for most RM staff, and gave the department time to learn from using iBuy at full scale before deciding on how to spread the work out more broadly.

During the migration project, the library team chose not to investigate integrations between the ILS and iBuy. It was not immediately clear how the two systems could be connected given that the ILS was missing data that would be necessary in iBuy's processes. Redesigning workflows in the ILS to hold new data and then proposing new automation to P&P would have been an uncertain venture using up valuable time during the short migration project. The library team also knew that Bobst would soon be undertaking a migration from Aleph to Alma, meaning that any potential integration between Aleph and iBuy would be obsolete in less than two years. The library team decided to postpone any work on integrations until after the Alma migration, when Bobst would have better understandings of both iBuy and Alma.

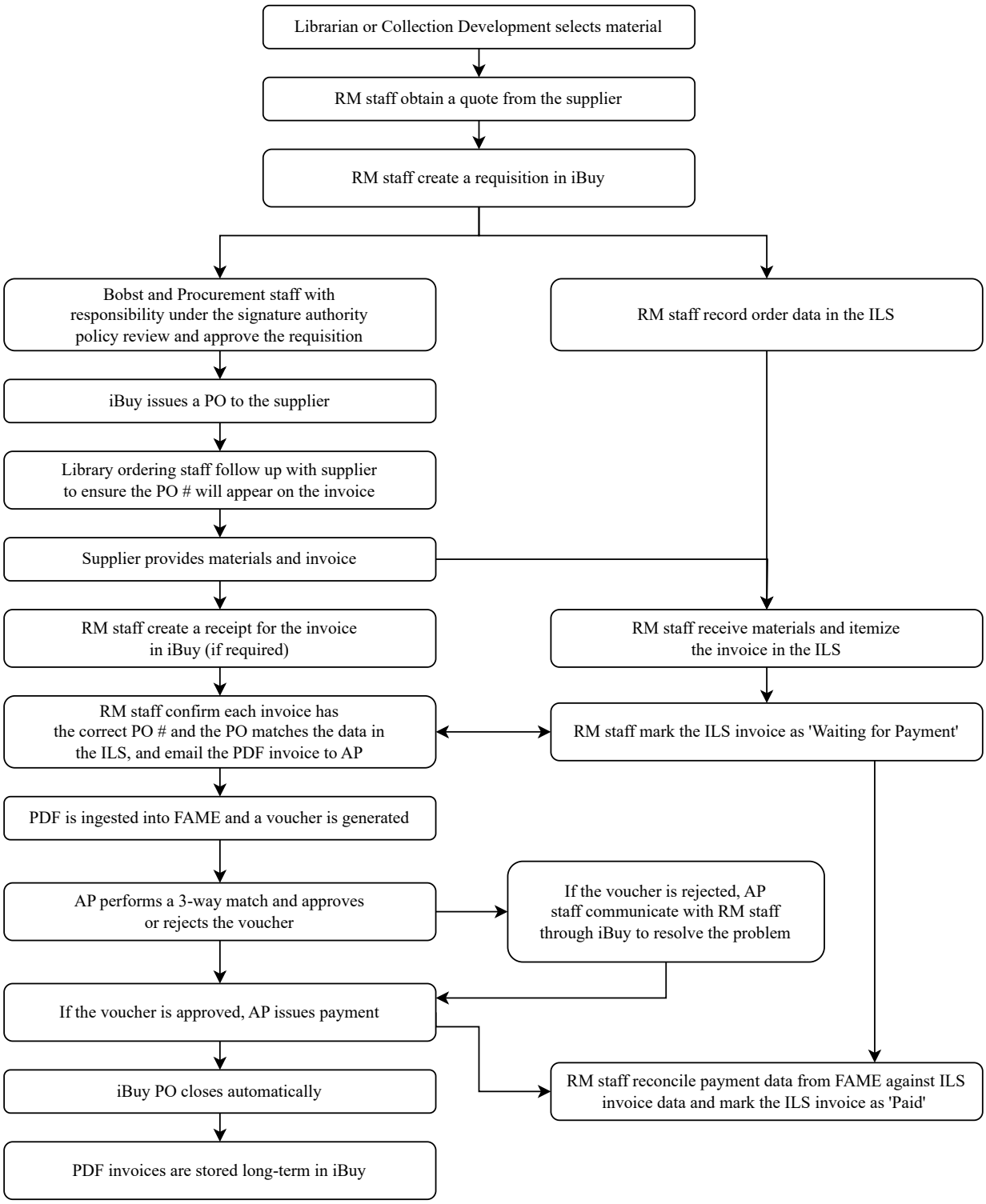

FIGURE 2. iBuy Non-Catalog/Bid Waiver Workflow. The Non-Catalog workflow is used for one-time purchases of up to $10,000. The Bid Waiver workflow is used for one-time purchases of $10,000 or more. The workflows are identical, with the exception that a Bid Waiver requisition includes a written request to Procurement to treat the supplier as a 'sole source' or 'preferred' supplier who can bypass the usual process of bidding large purchases out to multiple suppliers.

On January 1, Bobst ended its use of the invoice export workflow as scheduled and began paying all of its collections materials invoices against iBuy POs according to the standard campus workflows. This was a major accomplishment that resolved the problems with the invoice export workflow that had limited access to information about the library's collections materials purchasing. With iBuy, this activity is now fully visible in campus systems to appropriate staff inside and outside the library, just like the rest of the library's spending. At the same time, adopting iBuy also opened new workflow gaps for the library. Without the invoice export workflow leveraging the data already in the ILS to pay invoices, RM has faced a significant increase in manual work for each new purchase.

iBuy Workflows

RM uses five of iBuy's workflows for its collections materials purchasing: the Non-Catalog and Bid Waiver workflows, the Memberships/Subscriptions workflow, the Standing Order workflow, and the Punchout workflow.

The Non-Catalog and Bid Waiver workflows (see figure 2) follow the basic one-time purchasing process outlined above in the "Institutional Context" section. These workflows are used for one-off purchases such as a single order of books, an archival collection, or a one-time perpetual access e-resource package. Non-Catalog requisitions are used for purchases less than $10,000 and need no justification for the choice of supplier, whereas a requisition above that amount requires a Bid Waiver request accompanying the requisition. A Bid Waiver allows a requisition to bypass the university's normal practice of bidding out large purchases to multiple suppliers. This bidding process is not relevant for library collections materials suppliers, who typically offer unique selections of inventory and/or customized services (such as approval plans, metadata, etc.) that would not be easy for other suppliers to replicate. RM uses the Bid Waiver process to request that Procurement treat Bobst's vendors as "sole source" or "preferred" suppliers who do not need to submit bids to do business with the university.

The Memberships/Subscriptions process (see figure 3) allows the library to make payments in advance for renewals of print and electronic continuing resources. In these cases, the library confirms the renewal with the supplier, receives the invoice, and submits it as an attachment to a Memberships/Subscriptions requisition. Once the requisition is approved, iBuy creates a PO for internal use but does not send it to the supplier, and the invoice is attached to a voucher that proceeds straight to AP for processing. No record of receipt is required because the goods will be delivered after payment. First-time orders for e-resource subscriptions do not use the Memberships/Subscriptions workflow and are instead placed on Non-Catalog or Bid Waiver requisitions so that Procurement can review the initial purchase.

RM uses the Standing Order workflow (see figure 4) for rolling purchasing of books and other one-time physical items such as scores or audiovisual materials via approval plans and firm order accounts with booksellers such as Casalini and Harrassowitz. At the start of the fiscal year, the library requests a quote from the supplier for the amount of material the library plans to purchase. The library uses this quote to generate a single PO that can be used for all invoices throughout the year. Receiving staff enter

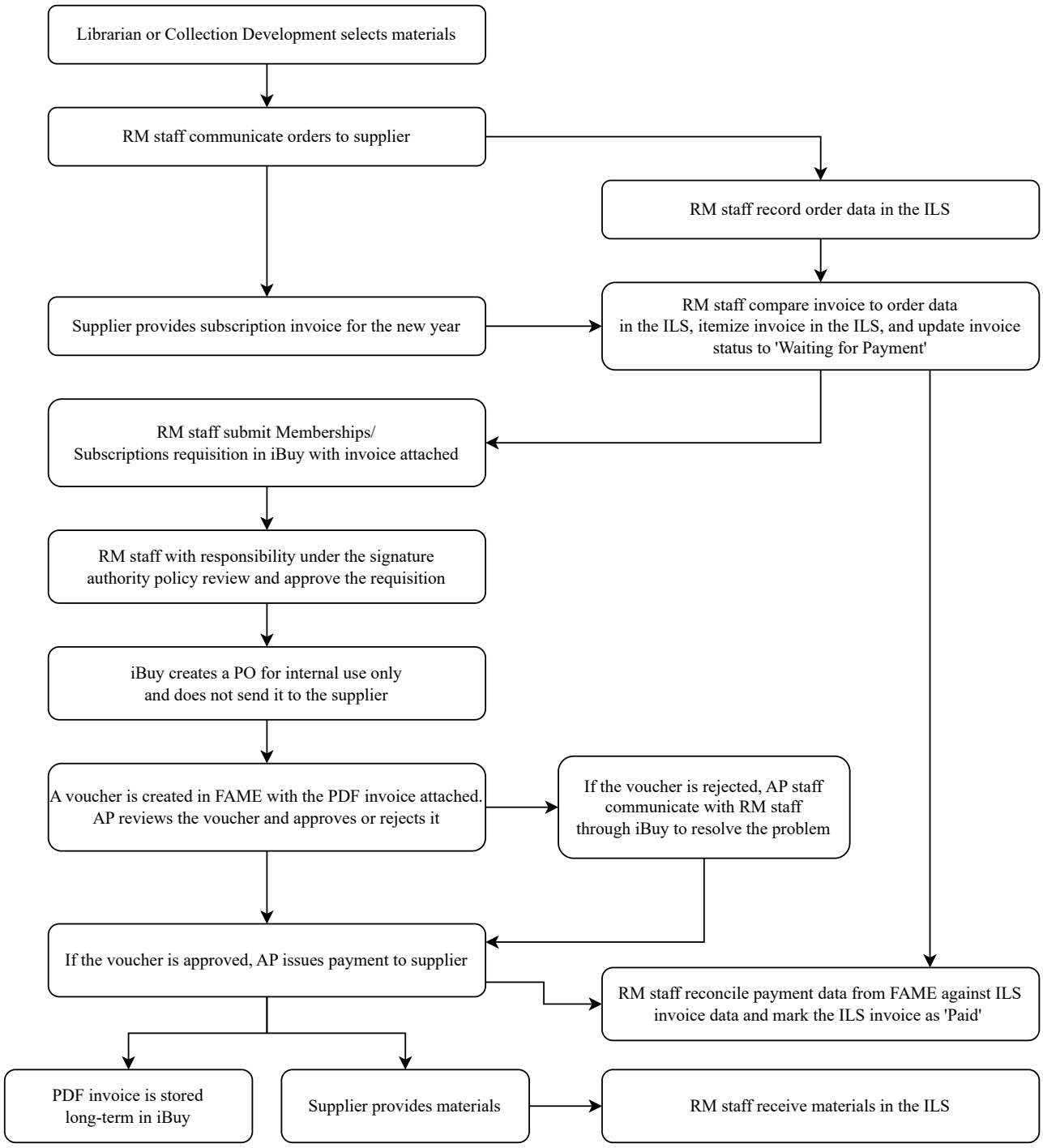

FIGURE 3. iBuy Memberships/Subscriptions Workflow.

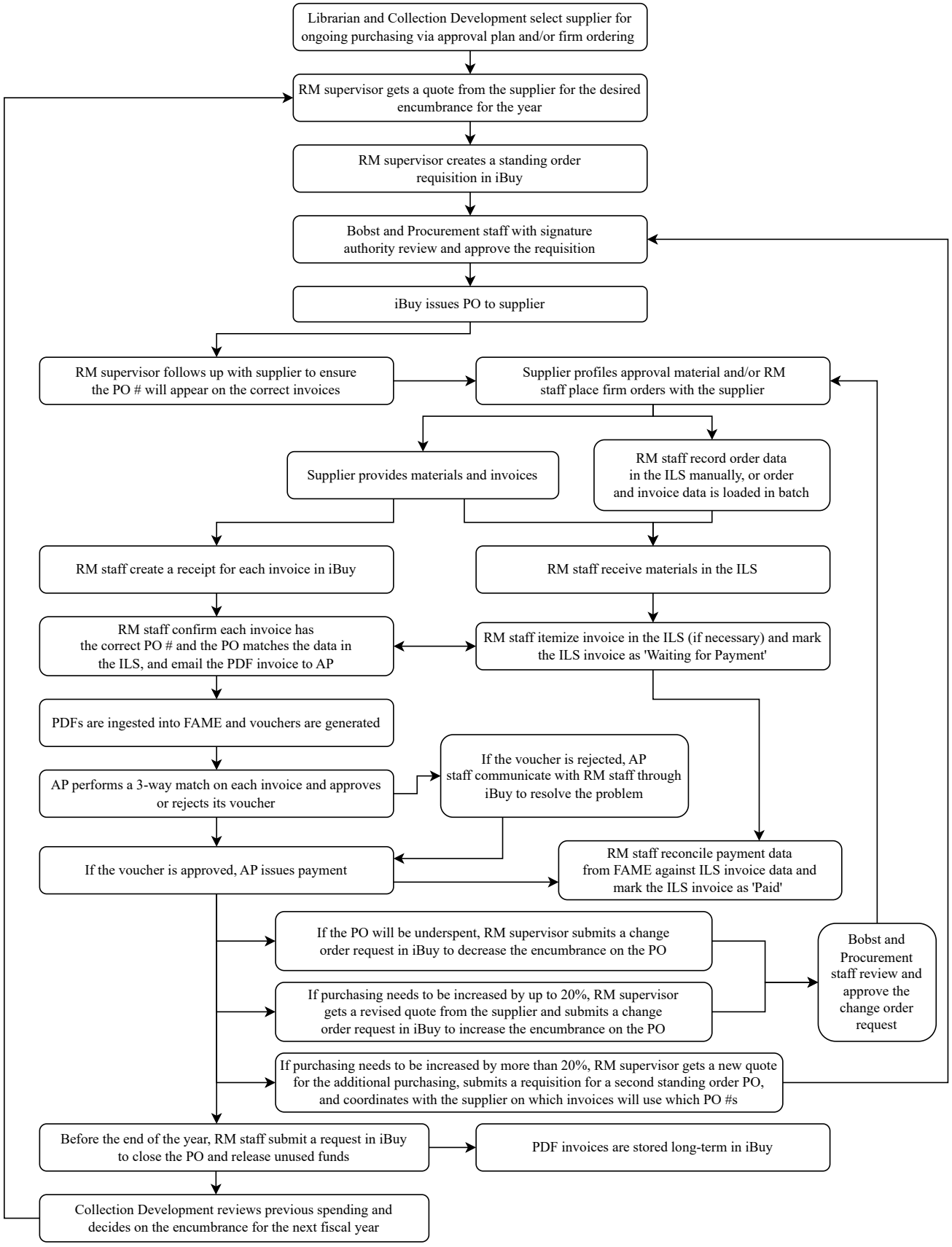

FIGURE 4. iBuy Standing Order Workflow.

a receipt for each shipment on the PO in iBuy, which AP uses to complete the three-way match for the corresponding invoice. This process prevents the need to issue an individual PO for every invoice, but it still generates considerable work of its own. Standing order POs require substantial effort to create and manage, while the many invoices that are supplied against them each need their own processing work in iBuy in addition to the ILS. The full implications of standing order purchasing are discussed below.

The Punchout workflow (see figure 5) applies only to RM's ordering from Amazon. NYU has negotiated with Amazon to integrate its systems directly with the university's so that they seamlessly exchange order, shipment, and invoice data in a process called "punchout" ordering. RM can create a cart on the Amazon website and import it directly into iBuy as a requisition. After the requisition is approved, iBuy automatically transmits the PO to Amazon, which sends back data on the resulting shipment and invoice. Because the library's Amazon POs are low-dollar orders that do not require a receipt in iBuy, automation at P&P completes the match for the invoice and initiates payment. Because library staff do not need to handle the invoice before it is paid, RM records the full invoice data in the ILS after payment as part of its reconciliation process.

iBuy's Effects in Resource Management

As anticipated, iBuy has created a significant amount of new work for RM. Figures 2 through 5 illustrate the multiple complex workflows now required in place of the single straightforward invoice export workflow shown earlier in figure 1. Each of these workflows requires new steps moving through an additional system in parallel to the ILS. The lack of integration between iBuy and the ILS means RM must now double-enter data in two systems. The need to match most invoices to university POs requires RM staff to carefully review thousands of invoices annually against their data in the ILS as well as the data on their POs before submitting them to AP. Table 2 shows that RM has completed thousands of additional tasks in iBuy related to collections materials purchasing since adopting the platform's workflows in fiscal year 2022. The practical effects of these new tasks have differed across the various iBuy workflows described above, and by extension across the different units in RM that use those workflows.

RM uses the Memberships/Subscriptions workflow for subscription invoices for print serials. Table 3 shows that RM handled relatively few (302) of these invoices for Bobst in fiscal year 2024. With a low volume of invoices moving through iBuy's simplest process, RM's unit that handles print serials has seen only a modest increase in new work, which it has absorbed without major disruption to its operations. RM estimates that each of these invoices takes on average two minutes to process in iBuy through the Memberships/Subscriptions workflow. Taken together, these invoices represent approximately ten hours (or a day and a half) of work for RM.

E-resources purchases use the Memberships/Subscriptions workflow when they are renewals, or the Non-Catalog and Bid Waiver workflows when they are not. Regardless of the workflow they follow, e-resources requisitions are often complex and require close attention. RM staff receive information and documents about upcoming payments from Collection Development, which negotiates packages

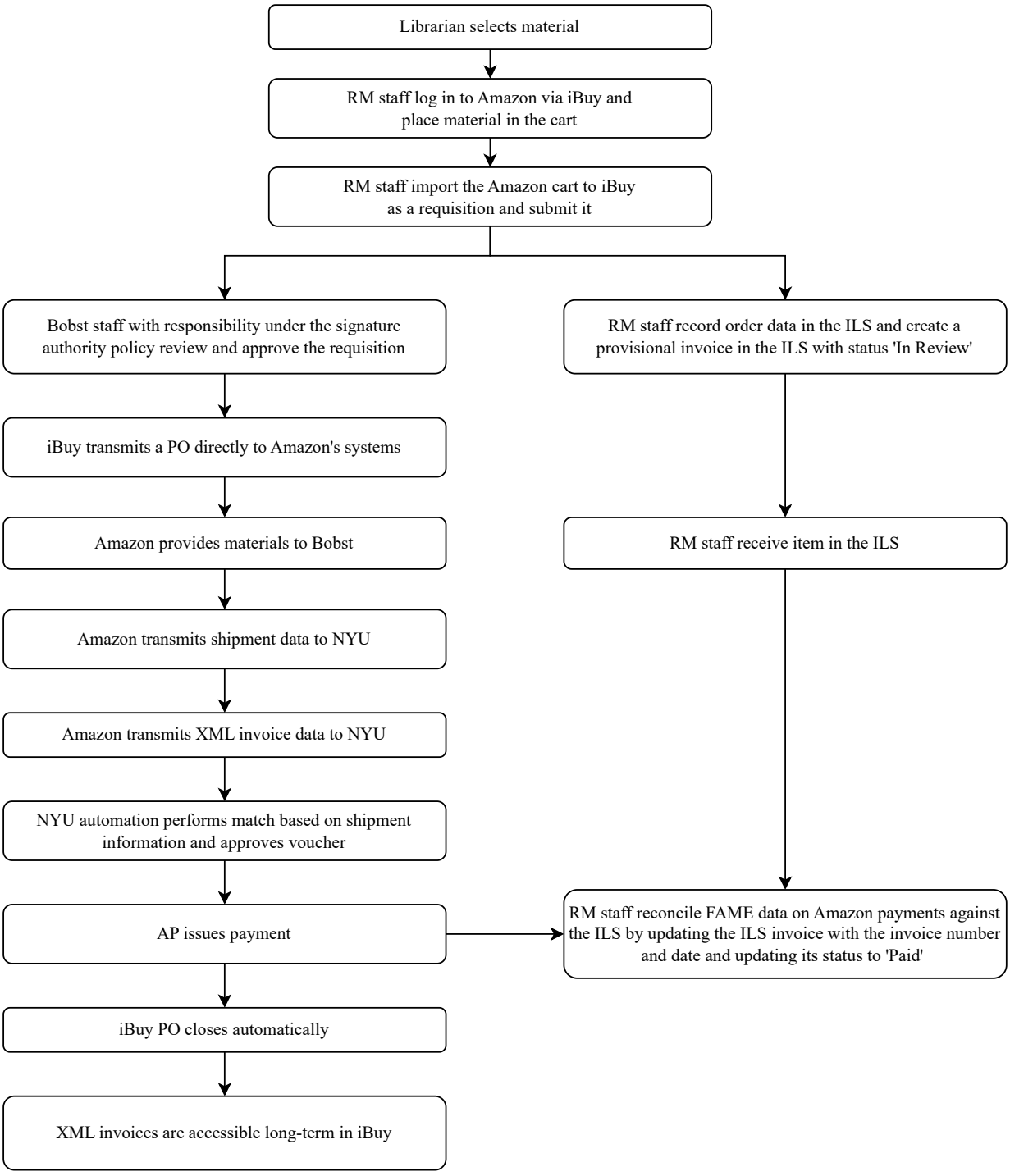

FIGURE 5. iBuy Amazon Punchout Workflow. Punchout requisitions typically do not require approval from Procurement or receipts in iBuy because they are low-dollar purchases that fall below the required thresholds.

Table 2. Total amount spent and number of books received on approval by subject.

Fiscal Year	2019	2020	2021	2022*	2023	2024
	While Using the Invoice Export Workflow			While Using iBuy		
Completed requisitions						
Bid waiver	0	0	0	74	92	94
Memberships/subscriptions	51	54	43	556	637	751
Standing order	0	0	0	57	65	55
Non-catalog	0	0	0	80	100	90
Amazon punchout	0	1	120	171	122	291
Subtotal	51	55	163	938	1,016	1,281
Receipts						
Standing orders	0	0	0	1,834	3,167	2,763
Other POs	0	0	0	99	144	140
Subtotal	0	0	0	1,933	3,311	2,903
Completed vouchers						
Standing orders	0	0	0	2,296	3,320	2,765
Other POs	51	55	210	1,182	1,242	1,288
Subtotal	51	55	210	3,478	4,562	4,053
Total iBuy functions	102	110	373	6,349	8,889	8,237

Note: This table presents all tasks recorded in iBuy related to work performed by RM on collections materials purchasing for all of the NYU Libraries locations it serves. Work performed in iBuy by staff at other NYU Libraries locations is not reported here.
*The count of vouchers for fiscal year 2022 is significantly lower than the corresponding number of invoices reported from the ILS in Table 3 because RM used iBuy for only eight months out of the fiscal year.

with suppliers and cost sharing with other NYU libraries. RM and Collection Development must communicate frequently to ensure RM staff understand each purchase before it is entered in iBuy. E-resources requisitions often need additional detail-oriented work rarely required in RM's other purchasing to split charges correctly between multiple libraries or across multiple fiscal years. Non-Catalog and Bid Waiver requisitions also require work after the invoice is supplied to verify the invoice against the PO and the ILS, record the receipt of the materials, and submit the invoice for payment. Table 3 shows that RM handled 958 e-resources invoices for Bobst in fiscal year 2024, each of which needed its own requisition in iBuy. RM estimates conservatively that each of these requisitions took an average of ten minutes to complete in iBuy. Based on this, RM estimates its e-resources unit spent 160 hours, or 4.5 work weeks, on iBuy tasks in fiscal year 2024.

Standing order POs in iBuy have had a similar effect on RM's unit that handles purchasing of books and other physical one-time resources. Table 2 shows that only 55 (4.3 percent) of the 1,281 requisitions

Table 3. Bobst General Collections Materials Invoices Recorded in the ILS

Fiscal Year	2019	2020	2021	2022*	2023	2024
	While Using the Invoice Export Workflow			While Using iBuy		
Electronic continuation invoices	463	444	477	448	469	538
Electronic one-time invoices	374	429	539	484	457	420
Print continuation invoices	504	332	422	409	356	302
Print one-time invoices	5,195	2,738	2,575	3,758	3,251	2,992
Total	6,536	3,943	4,013	5,099	4,533	4,252

Note: Data from the ILS is presented here to provide a sense of the scale of RM's work before adopting iBuy. ILS data also allows for distinguishing between print and electronic purchasing. Only data on RM's work for Bobst is included. Acquisitions work for other locations is shared between RM and the staff at those locations, and the data that distinguished which staff performed which tasks was not migrated from Aleph to Alma. This table includes payment card purchases, which are not recorded in iBuy and can no longer be systematically separated out due to data lost in the migration to Alma.

from fiscal year 2024 are for standing orders, but 2,765 (68.2 percent) of the 4,053 vouchers are associated with those standing order POs. RM estimates that processing one invoice on a standing order PO requires on average four minutes. This includes reviewing the invoice against its PO in iBuy, verifying that the data recorded in the ILS matches the PO, confirming that a receipt and voucher are not already present in iBuy, and finally, creating the receipt and emailing the invoice to AP. Across the 2,763 standing order vouchers processed by RM in fiscal year 2024, this works out to 184 hours, or 5.25 work weeks.

For RM, which operates on a lean staffing model relative to the scale of its duties, the estimated ten weeks spent on these iBuy tasks in fiscal year 2024 constitute a significant amount of work that has cut into the department's capacity to carry out its other functions. This ten weeks of work does not include all of the tasks that must be done around iBuy—it is only the work that can readily be quantified using the data available. There is also significant work to create requisitions for one-time and standing order requisitions for print materials, manage standing order POs, and produce regular reporting on encumbrances and vouchers, which all take additional time away from other duties. But even so, iBuy has not been as disruptive as the library might have expected. Table 3 shows that the number of collections materials invoices RM handled for Bobst has declined 34.9 percent between fiscal years 2019 (the last fiscal year before COVID-19) and 2024. The number of invoices for one-time physical items (the large majority of which are purchased via standing order POs in iBuy) has fallen even farther, by 42.4 percent, while e-resources invoices have increased slightly. This decline in invoices processed has occurred even as the library continued to spend out its annual acquisitions budget. Investigating the factors behind this drop is outside the scope of this article. It is important to note here simply that the addition of iBuy to RM's responsibilities has taken place during a time when the number of payments to be made has fallen significantly and that this in turn has helped RM accommodate the substantial new work required by iBuy.

Benefits and Gaps Resulting from iBuy

RM's new work in iBuy provides vital benefits for the university and the library. iBuy's automation integrates data and invoices for the library's collections materials into campus systems and preserves them there long term. This work has not merely checked a new box required by the university. It has also brought important improvements for Bobst. The library now has better, more detailed reporting from iBuy and UDW+ on its expenditures, as well as easy access to digital copies of paid invoices. These benefits align with Rowland's findings about the benefits that ERPs brought to universities.

But unlike those ERP adoptions, iBuy's automation has not reduced manual data entry for the library. Instead, the library achieves iBuy's benefits by performing *new* manual data entry in a second system. With the exception of vouchers issued against membership/subscription and punchout POs, every task recorded in table 2 represents a new manual action taken by RM. In the meantime, the department continues all of its previous workflows for recording order, receipt, and invoice data in the ILS. The only difference in the ILS is the fact that updating the ILS invoice's status no longer initiates payment at AP. All of this work in the ILS continues to be necessary to meet the library's own needs for managing its inventory, preventing unwanted duplication, and producing reporting on spending that can be related to copy-level data in the ILS such as location, subject classification, and usage. iBuy is not designed to hold this data and cannot replace these functions of the ILS. In addition to producing new benefits, adopting iBuy has also opened a major workflow gap for the library between the ILS and iBuy, which has resulted in the additional work RM now performs to complete its purchasing.

Bobst has not yet been in a position to close this gap by pursuing integrations between the ILS and iBuy as envisioned by Breeding. Now that the library has completed its migration to Alma and had time to get to know it, RM has ideas for projects that might connect Alma and iBuy. These potential integrations will be discussed in the conclusion. In the meantime, RM has worked to minimize the gap between Alma and iBuy by adapting its own practices and workflows in four areas: spreading work out to more staff, maximizing automation in the ILS, building a process to coordinate work across the ILS and iBuy using the Airtable app, and creating an interdepartmental workflow for managing PO encumbrances. Some of these new efforts have been successful, although one of them has produced mixed results. As Rowland reported about university ERP adoptions, understanding and addressing the gaps between the new system and the library's existing workflows has taken ongoing time and effort at Bobst.

Distributing iBuy Work in Resource Management

Late in 2022, after the arrival of new supervisors and almost a year's experience using iBuy, RM began to train additional staff to distribute iBuy work more broadly within the department. Each of RM's units has taken its own approach based on its own needs and workflows. Speaking broadly, however, many employees across the department are now able to enter requisitions and receipts, verify invoices against their POs, submit invoices to AP, and monitor the status of the resulting vouchers. Achieving

this was a major effort that involved providing training in a variety of formats over an extended period to help each staff person achieve proficiency in the new system. RM's manager and supervisors wrote documentation, provided training in group settings and one-on-one, and followed up with frequent check-ins about proper procedures. The library's Budget Office also contributed documentation and provided refresher training of its own for RM staff. Bringing frontline unit staff onto iBuy has had several benefits. Employees are now more knowledgeable about the university's financial processes and have a better understanding of the relationship between the data in the ILS and the data in the university's central systems. RM has redundancy and flexibility around mission-critical purchasing workflows, allowing the department to cover gaps during absences and vacancies. RM's time-consuming manual tasks in iBuy are now spread out across the department, instead of having only a few people responsible for a large volume of repetitive but highly sensitive data entry.

Expanding Automation in the ILS

Now that many staff are working in iBuy, RM has used new automation in the ILS to free up time for them to spend on the department's new procurement tasks. Before adopting iBuy, RM already relied heavily on automated processes built by KARMS' systems department Data Analysis & Integration (DAI) to load a variety of bibliographic, inventory, and acquisitions metadata for both physical and electronic resources. Automating this data entry is especially important for the large quantities of print and electronic books that Bobst purchases, which would be prohibitively time-consuming to process otherwise. When the library moved to iBuy, DAI was early in a project to develop automated processes to generate records for the ILS by scraping data off of PDF invoices from print booksellers who do not provide MARC records. With the new work required in iBuy to purchase these materials, RM and DAI prioritized this automation. DAI worked quickly to expand the PDF scraping process to fourteen additional suppliers during the first six months on iBuy; this eliminated the need for staff to manually add data title-by-title to the ILS for their books. Around the same time, DAI also developed new processes to automate the ongoing work of comparing e-book holdings in the ILS against the library's lists of its entitlements and retrieving the correct records from OCLC WorldShare to load into the ILS. Previously, this was labor-intensive work that e-resources staff performed on one e-book collection at a time. The new automation was a significant project intended to achieve major benefits across multiple areas—but one of its most crucial results for RM has been opening up time for staff to spend on the new work necessary in iBuy to complete the library's e-book purchasing.

Using Airtable for Task Management for Standing Orders

With the proliferation of tasks required for standing order POs, RM became interested in finding a tool to coordinate all of the combined work necessary for their invoices and materials in iBuy and the ILS. The books and other materials supplied on these standing orders already required complex, time-consuming processing in the ILS, and the addition of a parallel workflow in another system felt almost overwhelming. Bobst's legacy ILS, Aleph, did not provide overviews of all of the invoices and

items in various stages of processing, which made it poorly suited as a tool for managing the large volume of this work continuously moving through the department. RM was familiar with the cloud collaboration platform Airtable from its use in KARMS' metadata department Knowledge Access (KA) to manage surrogate cataloging work for branch and consortia partner libraries. KA customized an Airtable instance in which other technical services units use an online form to submit images of materials needing cataloging, which are then turned into tasks that can be assigned to staff and tracked. This suggested the potential for a similar workflow in RM to collect PDF invoices and organize their receiving and invoicing work across both the ILS and iBuy.

RM met with KA to understand their use of Airtable and investigated the platform's options for integrating with other apps and for customizing automated processes. After extensive design work, RM implemented a workflow in Airtable that ingested PDF invoices from supplier emails, assigned the invoices to staff using automated rules, and let staff update the invoices' entries as work progressed in the ILS and iBuy. RM also integrated Airtable with an email application called Zapier so that staff could click a single button within Airtable to send an automated message to AP with the PDF invoice. RM understood that using Airtable would create its own work but proceeded in the hope that the platform would reduce the gap between iBuy and the ILS by providing a unified overview of work in both systems while also simplifying the process of routing invoices to AP.

In the end, however, the Airtable workflow has produced mixed results. First, unexpected problems arose with the email integration. During the design phase, RM had used Airtable and Zapier to send test emails with invoices that were all successfully ingested as vouchers. But when working at full scale, receiving staff found that many emails from Airtable were blocked by spam filters at AP, and the invoices were not turned into vouchers. Lengthy troubleshooting with campus IT did not resolve the problem, and receiving staff have had to resume manually handling the department's PDF invoices for standing order POs. For the period when Bobst was still using Aleph, its lack of functionality for tracking work meant that Airtable remained useful even without the email integration. Since then, the library has migrated to the next-generation platform Alma, which includes capabilities for monitoring queues of receiving and invoicing work and for storing PDF invoices. RM's initial analysis is that Alma may be able to fill some or all of the same needs as Airtable using data already in the library's system. Airtable has been an important part of RM's first two years on iBuy, but the department is now planning to reassess its use in the coming year and may retire it.

Encumbrance Management

Like other aspects of iBuy, PO encumbrances have brought benefits to the library while also creating new work that has required significant workflow adjustments. During the time the invoice export workflow was in use, the large majority of Bobst's collections materials purchases did not use university POs, which meant that most acquisitions funds were not encumbered before they were expended. The library managed its collections materials budget by monitoring expenditures and using spreadsheets to tabulate upcoming expenses. These spreadsheets required work to assemble, but this scenario also gave

Bobst considerable flexibility when it needed to change its spending plans. For example, if a supplier sent less approval material than expected, then the library simply paid for what was provided, used the unspent money on other materials, and worked with the supplier to address the drop in material.

With iBuy, however, funds are encumbered as soon as a PO is issued, meaning the money is committed in advance and cannot be used for anything else without a request to alter or cancel the PO. Encumbrances have simplified reporting on future spending, which can now be easily generated by using iBuy or UDW+ to produce data on all the library's open encumbrances. At the same time, the library has learned that encumbrances require active monitoring and maintenance throughout the year to make sure that funds are not tied up in incomplete or underspent POs. Any situation where a PO hits a snag, or where a standing order PO will not be fully spent down, must be identified and addressed promptly to complete the payment or release the unused funds. Standing order POs in particular generate a significant amount of work over the course of the fiscal year. Figure 4 illustrates how changes to spending on a standing order PO must be managed by making a request to change the encumbrance or even open a second standing order PO (if spending will be increased by more than 20 percent). RM must also now communicate with each supplier to cut off shipping on their POs approximately ten weeks before the end of the fiscal year to complete receiving, reconcile statements, have all invoices paid, and release unspent money with time left over to use it for something else. With more than fifty standing order POs to reconcile and close at the same time new ones need to be opened for the new year, this creates a crush of work for the affected supervisors at the end of the fiscal year. At the time of going live on iBuy, the library team knew that encumbrances would be a part of using the platform but did not anticipate all of their implications or the full scale of the work they would create.

After two years of experience in iBuy, the library has filled the gap with its previous workflows by building new internal processes to use encumbrances for the library's benefit. In Bobst's first annual cycle on iBuy, the library team was focused on training and assignments for the work of entering requisitions, receipts, and invoices. There were no specific workflows to establish who should produce reporting on encumbrances, when to request a decrease or increase to a standing order's encumbrance, who should communicate when with suppliers, or what scenarios constituted serious causes for concern. As a result, there was a constant churn of questions about how to handle specific POs that were too numerous and granular for the existing meetings where Collection Development, the Budget Office, and RM reviewed overall expenditures. In spring 2023, these three units began a separate cycle of regular meetings dedicated to reviewing PO encumbrances and addressing problems as they arose. Out of these meetings, a set of practices has developed for generating reporting, deciding on encumbrances for each new year's standing order POs based on collecting goals and past spending, communicating with suppliers, and resolving problems. These tasks have created considerable overhead on top of the day-to-day work of receiving and invoicing in iBuy, but the effort has paid off at the end of the fiscal year when POs are closed out on time, unused funds are available again, and Collection Development has accurate data on the remaining budget to be spent before fiscal close. At the time of writing, the library team is producing written guidelines that will codify these practices into a well-defined framework for ongoing interdepartmental management of this new and complex aspect of the library's purchasing.

Conclusion

More than two years on from Bobst's move to iBuy, the library has adapted to the platform and successfully spends out its annual collections materials budget through its workflows. As in the university ERP adoptions Rowland analyzed, Bobst has undergone a lengthy implementation lasting well beyond the original go-live date. iBuy has produced significant new benefits compared to the library's legacy payments workflow, which exported limited data from the ILS to the ERP and was opaque to staff outside technical services. Using iBuy has brought the library's collections materials purchasing into alignment with standard university workflows, integrated crucial data into campus systems on what has been purchased and who authorized it, and ensures digital copies of invoices are available long term. These are major improvements for the university and also for the library, which now has better access to information on its own spending while being relieved of its responsibilities for keeping a paper audit trail and maintaining the custom automation for the legacy invoice export workflow.

In other ways, Bobst's adoption of iBuy for collections materials purchasing has diverged from Rowland's findings. Rowland reported that new ERPs automated tasks that university employees were previously doing manually, freeing up their time for higher-level work. But at Bobst, iBuy's automation has not replaced the existing processes in the ILS. Instead, RM continues to carry out all of that work to meet the library's internal workflow and assessment needs, with the result that the library now does additional work to record each purchase twice in unintegrated systems.

Addressing this new work has required ongoing effort at the library to analyze problems, prioritize them, and develop solutions. Because using iBuy is a necessity, and Bobst has not yet been able to close workflows gaps through integrations between the two systems, the library has instead focused on updating its own workflows around collections materials purchasing. In some situations, this has taken the form of customizing its own processes to streamline and organize work, whether by adding new automation to reduce manual data entry in the ILS or by building a workflow in the Airtable app to simplify invoice handling and coordinate work between the ILS and iBuy. In other cases, Bobst has adapted itself to iBuy by training more staff in the university's standard processes and by building new workflows to manage PO encumbrances. This experience has aligned with Rowland's finding that an adoption of an outsourced system entails an extended process of filling gaps between the new system and the organization's past practices.

Even after these efforts, it remains the case that each new acquisition requires more time and work with iBuy. RM continues to do its same work in the ILS and now performs additional work on top of that to push the library's purchases through iBuy. This new work has added up significantly at scale, in particular for complex e-resources requisitions and for the large number of receipts and invoices that need to be processed for physical materials on standing order POs. Coincidentally, over the same time that the library has been using iBuy, the overall number of invoices RM handles for Bobst annually has fallen, which has helped RM complete the new work that iBuy requires while keeping a handle on its other tasks. Taking on new purchasing that would return invoicing to previous levels (with the requisite

work in iBuy) would be challenging for RM and could produce workflow bottlenecks, jeopardizing the new collecting goals.

To avoid this scenario, RM plans to investigate potential integrations between the ILS and iBuy over the coming years, as suggested by Breeding. The library team chose not to pursue integrations at the outset for two reasons. The team knew that the ILS at the time was missing crucial data that would be difficult to add and integrate with iBuy during the migration project. The team also knew that Bobst was about to embark on an ILS migration from Aleph to Alma, meaning that any successful integration would soon need to be rebuilt. Now that Bobst is more than three years into using iBuy and has completed its migration to Alma, RM has hopes to export order data from Alma to create requisitions in iBuy and also to hold PDF invoices in Alma and export them to AP as part of Alma's invoicing workflows, rather than emailing each PDF individually. These ideas will require discussion with P&P to determine whether they are compatible with university requirements, but RM is hopeful that new automation can bridge some of the remaining gaps between iBuy and Alma to free up staff time for other work serving the library's users.

A number of lessons that may be applicable to other libraries can be drawn from Bobst's experiences with iBuy. Changing procurement workflows for collections materials requires full attention and cooperation from relevant departments. Whether a library is adopting an outsourced platform for the first time or migrating from one platform to another, it should be prepared for an extended implementation process. Managers should expect gaps between the new system and prior practices that may have significant workflow impacts. These gaps may be apparent ahead of time or may come into focus only after adopting the new system—but either way, they will require time, effort, and collaboration to address. As a result, managers should budget adequate time for testing the system, writing documentation, training staff, and iterating workflows as the library learns from experience. Processes in the ERP or e-procurement system may continue to evolve over time. At the time of writing, NYU's P&P office has just announced new workflows around service-level agreements, insurance, and risk management that may require additional work from Bobst for some of its collections materials purchasing. Effective communication with colleagues in the campus procurement and AP offices is key. Library staff should take care to cultivate these relationships, help university procurement staff understand collections materials purchasing, and discuss any automation in advance (no matter how seemingly simple, such as RM's Airtable emails). Most importantly, library managers and staff should be prepared to embrace the benefits that the new system will hopefully provide, even when achieving them requires new or different work.

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Book Review

Michael Fernandez, editor

RDA and Serials Cataloging, Second Edition. By Ed Jones. Chicago: ALA Editions, 2025. 240 p. $69.99 softcover (ISBN 978-0-8389-4871-2).

The second edition of *RDA and Serials Cataloging* is an update to the 2013 first edition and focuses on what author Ed Jones calls "Official RDA." That is, the 2020 Resource Description and Access (RDA) standards described in the RDA toolkit.[1] According to Jones, this book "is designed to be used by serial catalogers who are new to RDA and by monograph catalogers who are new to serials cataloging" (vii).

Overall, the style is easy to read, and the terms used are thoroughly explained. The instructions are very detailed, and appropriate background information is provided. This new edition still discusses the changes from AACR2 to RDA, which are helpful for catalogers new to RDA or for others to understand older serial records. Jones thankfully includes the old RDA numbering so that readers can search for the desired sections in the RDA toolkit, as it sometimes can be difficult to search. The beginning of sections and subsections have a list of RDA elements discussed for easy reference. Most of the book is divided into two parts—"Part I: An Introduction to Serials, Serials Cataloging, and RDA" and "Part II: Cataloging Serials and Ongoing Integrating Resources Using RDA." There is also an epilogue titled "RDA and Linked Data."

In part I, Jones begins by defining what a serial is with examples from the International Standard Serial Number (ISSN) manual,[2] detailing some aspects of a serial, and describing the various types of serials. These sections are especially useful for catalogers new to serials and a good refresher for others. He also includes a history of cataloging with some emphasis on serials. This history is interesting, but may be too long for most readers as it is about thirteen pages. For those new to RDA, Jones gives a brief summary of the standard and how it relates to serials. Included are helpful information on the organization of the RDA toolkit and how the Library Reference Model (LRM)[3] deals with serials. The part ends with search strategies on how to locate an existing cataloged serial record, as most catalogers hope to locate an existing record for the serial or at least one they can use as a sample. In the second edition, this chapter moved from part II to part I.

In the first edition, part II also contained one additional chapter (chapter 4) with most of the instructions for cataloging with several subsections and was about two-thirds of the book. The subsections have now mostly become their own chapters. Part II begins with a brief overview and "General Instructions" describing some background information, machine-readable cataloging record (MARC) fixed fields, terminology, core elements, and some general rules for serials.

Chapter 5, "Bibliographic Description," is the heart of the book as it gives specific instructions of how to catalog a serial. Details include source of information, RDA elements, content/media/carrier fields, titles, statements of responsibility, editions, numbering, publication information, materials description, series, notes, and frequency. There are lots of short-snippet examples of the item being explained and the MARC indicators to use. Jones often gives a short example and then a more detailed example. This section will likely be the most heavily used. However, some readers may need more of an explanation

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of the 0-8 International Standard Bibliographic Description (ISBD) standard[4] used as the basis of organization of the chapter.

The subsequent chapters give more details on relationships, authors, and access points—some of the thornier areas of serials. Jones offers a very thorough explanation of how one serial is related to another and provides several examples of how to connect two serials toward the end of the chapter. But it may have been beneficial to include a couple of full MARC record examples showing the former serial title and new serial title. In "Identifying Serial Works and Authors" (chapter 7), Jones focuses on corporate authors as most serials do not have personal authors. Plus, he briefly gives instructions when catalogers need to enhance a non-unique title to differentiate titles with the same name. There are several examples at the end of the chapter. However, on page 142, the numbering starts again for criteria of author corporate body; therefore, in the examples that follow, the numbering is off. This could be confusing for some readers and should be fixed in later printings. There is also a brief discussion of creating access points, once again focusing on corporate bodies. Finally, at the end of chapter 8, there is a full example of a serial MARC record with helpful notes. Readers may prefer full MARC records earlier in the book, possibly at the end of chapters 5–7.

Toward the book's end, Jones provides specific information on cataloging online serials and integrating resources. Included in "Online Serials" (chapter 9) are the differences with print serials. Jones does say they are now prevalent—"Nowadays serials tend to be 'born digital' and are only subsequently issued in print" (169). Thus, he probably should have spent more time on them or integrated the differences more into the text. Likewise, Jones discusses the differences between cataloging integrating resources and serials. He also gives helpful advice on whether catalogers should or should not catalog various websites. The full MARC record examples at the end of these two last chapters with notes help catalogers see the MARC record put together.

Lastly, the book concludes with an epilogue "RDA and Linked Data," providing some insight into the future of cataloging. This section discusses linked data aspects of RDA, the Library of Congress's development of the BIBFRAME editor, and some issues associated with its widespread adoption. Jones does not get into many of the details, as he still sees linked data as something in the future.

RDA and Serials Cataloging, Second Edition has unmatched information on cataloging serials that will help all catalogers of serials or those wanting to learn more about serials. Readers will find it much easier to locate and understand topics than the RDA Toolkit. Plus, the book has a substantial index for easy topic look-up. However, there are a few places that could be improved. Some sections could use more detailed examples than snippets. Jones makes this concession—"Also it cannot be emphasized enough that this manual, like all static products, was already out of date when it was published" (39). This statement appears to be true in some areas. This new edition should have had more of a focus on online serials and integrating resources instead of adding chapters at the end of the work, since most new serials are likely to be online. Still, this title is a helpful reference tool when cataloging serials.—*Lisa Romano (lisa.romano@umb.edu), University of Massachusetts Boston, Healey Library, Boston, Massachusetts*

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Book Review

Michael Fernandez, editor

E-Resource Licensing Explained: An A-Z Licensing Guidebook for Libraries. By Rachael Samberg, Katie Zimmerman, Samantha Teremi, Erik Limpitlaw, and Sandra Enimil. Washington, DC: Association of Research Libraries, 2025. 502p. $15.89 softcover (ISBN 979-8-307164-17-4); open access ebook (ISBN 978-1-948964-60-9).

Many librarians, especially those who deal with electronic resources, are put in a position where it is their responsibility to read, interpret, and negotiate license agreements without having previously received any legal training. *E-Resource Licensing Explained: An A-Z Licensing Guidebook for Libraries* seeks to bridge this gap in knowledge by educating its audience on important terms and their legal implications. In addition to theoretical knowledge, it also provides practical examples of desired language and acceptable alternatives. As such, it plays an important role in providing context on different options so that librarians can make informed decisions when negotiating on behalf of their libraries.

E-Resource Licensing Explained expands on several model license agreements and other excellent sources. Many of the sections include recommended language that comes from either the LIBLICENSE Model License Agreement from the Center for Research Libraries, the California Digital Library Standard License, or the NorthEast Research Libraries Consortium General License Agreement.[1] Thorough footnotes provide the ability to easily reference additional sources, relevant cases, and background information for the individual clauses covered.

All of the typical clauses in an e-resources license agreement are covered by the monograph, with focused chapters that make it easy to jump directly to a topic of interest. Within each chapter, the authors argue in favor of libraries keeping the broadest variety of rights available. This makes it easy for a library to quickly reference a section that describes a right that is important to them and find the language to help them argue for it. On the other hand, as a cover-to-cover read, it may seem overwhelming to the new librarians who are most likely to benefit from its instruction. More guidance on how to determine which clauses are important to the reader's institution, rather than assuming that all institutions hold the same priorities as those of the authors, would not be out of place. Some of the authors are better at this than others, creating a slight inconsistency between the sections.

The extended section on artificial intelligence (AI) limitations (chapters 13–16) is particularly timely. Licensors are seeing threats to their data security—as well as new revenue streams—and are attempting to limit library access, use, and development of AI programs through new restrictive language in license agreements. The authors provide an in-depth analysis of why AI clauses should be vigorously challenged alongside applicable suggestions for how to counter negotiate.

I was surprised to not see a caution about the university agreeing to participate fully in a licensor's investigation of a breach by authorized users. This language can appear in a license's sections on breach or cure, but neither chapter cautioned against its inclusion. Chapter 29, "Patron Data Privacy," outlines numerous reasons why libraries should be cautious about sharing user data and includes terms

limiting what vendors can do with data they've acquired from users. This may be sufficient if a library is successful in getting a vendor to incorporate all of the lengthy suggested terms into the contract. However, there can be clauses hiding elsewhere in the contract that could jeopardize user privacy and put patrons at risk. Chapter 4, "Authorized Users Definitions," is clear that it is important for a library to not take on the liability of a breach by its users. Neither should a library expose users to legal action based on the terms of the library's agreement, which can inadvertently happen if librarians are not vigilant about reviewing all clauses of the contract for problematic inclusions.

Additionally, a new electronic resources or licensing librarian is likely to inherit a large number of preexisting contracts that include many of the terms that the text encourages librarians to avoid. Renegotiating licenses is sometimes trickier than negotiating them in the first place because there has been a prior expectation set between the vendor and the library. Additionally, a library may have come to rely on an existing resource and be unable to walk away if negotiations fail. Although possibly out of scope for this volume, I was left considering best practices for legacy licenses and the potential workload of trying to update all of them "to achieve the information policy goals of ARL," as was stated by Katherine Klosek in the foreword.

Overall, *E-Resource Licensing Explained* provides excellent training on why librarians should care about certain terms and what to look out for in license language. When introduced, the model license agreements supplied libraries with negotiating power by providing examples of language to use in a counteroffer. This monograph further improves a librarian's ability to negotiate successfully by equipping them with reasoning to argue their case. The authors envision this as a living document that will be updated with additional information and sections over time. If done successfully, this would cement *E-Resource Licensing Explained* as a critical resource for training new librarians on licensing requirements and as a key reference tool for ongoing use.—*Rebecca Walton (rebecca.walton@byu.edu), Brigham Young University, Provo, Utah*

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