

Towards a model for holistic electronic resources assessment at American University Library

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Abstract:

This paper describes a methodology established at American University Library to assess its collection of electronic resources. The project initially analyzed usage statistics for databases only, but over the years, the assessment has expanded to include additional resources such as e-journals and e-books, as well as qualitative assessment metrics and additional applications for promoting the library's value and impact.

This assessment project was initiated out of a university mandate to reduce the library's overall budget by 3% over a two-year budget planning cycle. To meet this short-term goal, the library's Electronic Resources Librarian and Director of Technical Services in collaboration with the Electronic Resources Management Unit developed a workflow for collecting COUNTER compliant usage statistics for databases. These usage statistics were analyzed against financial payments for each title to establish a cost per use measure. Based on this data, the librarians developed tiers of database titles which could be cancelled based on university financial requirements.

This paper defines the COUNTER code of practice in its former and current release, and how to integrate this data with financial information to create a cost per use metric for comparison between resources. In addition, the paper will outline the assessment project at American University Library which used this data to determine the value of a resource to the library and the impact of cancellation. The paper will describe the subsequent phases of assessment which included e-journals and e-books. With publishers transitioning to COUNTER Release 5, the paper identifies future challenges in modeling longitudinal usage data across COUNTER releases. Finally, the paper reaffirms the necessity to move beyond measures such as cost per use for collection evaluation, and supply vision towards a model where qualitative guidelines are added to enhance and provide context for the quantitative usage statistics.

Keywords: Electronic resources, serials, COUNTER, usage data, collection evaluation

Introduction

It is well documented in the literature that library collections budgets are increasingly stressed as libraries evolve to meet changing user needs. New areas of research demand more online resources such as databases, e-journals and e-books, streaming video, commercially-produced datasets and customized geospatial data, while still maintaining collections of print. Libraries are expanding their services to include bibliographic instruction, maker spaces, and developing processes for capturing scholarly communication and research data. The expanded collections and services all require staff with broader portfolios of skills and deeper subject expertise. The cost of individual resources, whether they are books or continuations, print or online, have continued to increase at a rate above the average inflation for other goods and services. The evolutionary path of the 21st century library into new areas of collections, services, and skills collides with marketplace forces over competition for scarce library funds.

An appreciation of these forces for acquisitions, collection development, and technical services librarians is critical for developing assessment tools to ensure that collections budgets are expended in cost-effective and impactful ways. This paper describes a methodology established at American University (AU) Library to assess its collection of electronic resources. The project initially analyzed usage statistics for databases only, but over the years, the assessment has expanded to include additional resources such as e-journals and e-books, qualitative assessment metrics as well as additional applications for promoting the library's value and impact. This project provided a proof of concept for the establishment of an assessment program at the AU Library and the importance of standards as a metric. Over the course of several years, what started as a rudimentary database review has evolved into a comprehensive assessment program and holistic collections review.

Meeting the Budget Reduction Challenge

This electronic resource review project was initiated in 2015 from a university mandate to reduce the library's collections budget by 1% for the coming fiscal year of FY2016 and 2% for FY2017. The library was given three months to identify how these cuts would be made. Because of this short time period, the library had to identify titles which could be cancelled quickly and with minimal user impact while providing a rationale for cancellation. To meet the deadline, we decided to review high cost titles which generally means databases. These resources, however, are heavily used so they could potentially have a high impact on our users. Consequently, we decided that we needed to conduct a quick collection review which would identify and analyze to reveal databases which were expensive and under-utilized based on a cost per use (CPU) metric.

Studies on collection evaluation are prevalent throughout the library literature, especially since e-resources have surged to prominence in terms of usage, cost and importance to users. Six critical elements for a successful assessment program (Covey, 2002) include the following:

- Collecting meaningful, purposeful data
- Developing skills to gather, analyze, interpret, present, and use data

- Developing comprehensive assessment plans
- Organizing assessment as a core activity
- Compiling and managing assessment data
- Acquiring sufficient information about the environment to understand trends in library use

In developing the methodology for evaluating databases, the library identified necessary data, developed tools such as spreadsheets for analyzing the data, and identified as well as communicated with stakeholders. Through this process, the library developed a workflow which proved scalable to other formats and which integrated assessment into the lifecycle of the library's fiscal year.

Usage Data and Collection Evaluation

The project was led by Technical Services librarians who identified CPU to determine value of a database regardless of its actual cost. This metric would highlight the most-heavily used resources to determine the impact of a cancellation. To identify users who would be impacted and to determine CPU, we identified the following three data points:

- Users
- Cost
- Usage

Once we knew the datapoints, we needed to determine where these data points reside within our library systems. In identifying the users for each resource, we were able to rely on our collections ledger. The fund structure identifies each university department as well as the organizational unit where the department resided. In turn, each university department has a liaison subject librarian who teaches classes, supports faculty research, and selects resources for the library's collection. The subject librarians are known and trusted by their faculty, and they became the point person who would lead in the evaluation of a database, understand its need and the history of its acquisition, and communicate with faculty if a resource was cancelled.

This funding structure also enabled us to identify stakeholders for each resource based on the fund assigned to each resource. Once we had the funds, we were able to use Microsoft Excel to categorize each title by department and by liaison librarian. Consequently, the cost per title could be easily extracted by reporting out each invoice payment for each fund.

Determining usage of online resources is more complex. Circulation statistics as collected by the library's circulation system is a simple way to measure usage of a print resource. Measuring usage for online resources, however, is in the hands of the vendor and out of the library's control. Since online usage is determined by counting clicks, vendors control how usage is calculated. The library depends on the vendor to accurately and consistently count usage. Not all vendors agree on how to calculate this metric, hence the importance of standardization to enable analysis across various platforms.

Assessment of library resources usage is dependent on reliable and consistent data. Project Counting Online Usage of Networked Electronic Resources (COUNTER) developed in response to this need as the format landscape definitively shifted from print to electronic. COUNTER was formed in 2002 as a collaboration between libraries, publishers, and other

vendors to develop a standardized measure of electronic resource usage. The COUNTER Code of Practice was first published in 2003 and has continually evolved through subsequent releases and related initiatives (Pesch, 2011).

Numerous examples exist of libraries retrospectively consolidating years' worth of COUNTER data for collection assessment, often prompted by mandatory or anticipated budgetary cuts at their institutions (Cooper, 2013; Sutton, 2013; Enoch & Harker, 2015; Nash & McElfresh, 2016). COUNTER enables consistency for comparing usage across multiple platforms from different vendors and can be used to create CPU calculations. While COUNTER provides standardization in measuring usage, determining CPU and modeling usage analysis has widely varied across institutions. Determining workflows for gathering, consolidating, and presenting e-resources usage data often results from the integration of disparate measurement and reporting tools, both locally developed as well as e-resource management products from third party vendors (Fry, 2013).

Other studies have integrated additional metrics beyond COUNTER usage, such as journal rankings and citation counts (Pastva et al, 2018), finding significant correlations between rankings and usage (Gao, 2016). Combining usage statistics with citations has been modeled as a strategic method for collection analysis, particularly when reviewing Big Deal journal packages (Wical & Vandenbark, 2015). In terms of modeling usage data, increasingly visualization tools such as Tableau are being utilized by institutions (Lewellen & Plum, 2016). This opens the possibility of moving towards a self-service model where customizable subject-specific reports can be autonomously generated by liaison librarians, obviating the need for collection development and acquisition units to manually collate and distribute reports themselves (Tucker & Sinha, 2018).

The limitations of current practices for e-resource usage statistics are also well documented. As the tools to gather e-resource statistics have evolved and facilitated calculated metrics such as CPU, there's a tendency to rely on these figures at face value. However, any CPU based off COUNTER statistics is assessing "usage" as it is defined by the current code of practice (Bucknell, 2012). For example, the widespread adoption of discovery layers and federated searches resulted in an inflation of search statistics, because each discovery or federated search query gets run across multiple databases and targets. So, while these databases may have low CPU numbers for searches, that's not a good measure of how they're used.

The COUNTER code has also evolved to address technological changes and provide more accurate measures of use. However, as the COUNTER code adds, removes, or modifies metrics with each new release, the potential for longitudinal analysis across multiple releases becomes more difficult or impossible altogether (Pratesi, 2018). As a result, libraries have moved to more holistic collection analysis, complimenting CPU calculations with other metrics such as ILL requests (Barton, Relyea, & Knowlton, 2018), impact factor (Gao, 2016), and citation analysis (Wical & Vandenbark, 2015).

Methodology

At the time the library used Voyager as its Integrated Library System (ILS). In Voyager, reports on various aspects of data are pulled using SQL and MS Access. Usage statistics were gathered from several sources. The bulk of COUNTER reports were received through our subscription to ProQuest's Serials Solutions 360 COUNTER Data Retrieval Service (DRS). Manual effort by staff was required in cases where publishers had instituted multi-factor

authentication on their platforms or when usage statistics were only available through direct request to the publisher.

An additional hurdle was presented by publishers who provided usage statistics that were not COUNTER compliant. In some cases, it was simple enough to roughly map this usage to COUNTER reporting when common metrics, such as searches or full-text article downloads, were present. In other cases, imperfect measures, such as individual page views or hits, had to be used when that was the sole usage data being provided by the publisher. Still, this was preferable to the roughly 25% of databases with absolutely no usage statistics provided by the publisher.

Much of the complexity in AU Library's serials review process stemmed from merging data that originated across disparate sources. In this case, the financial data was being pulled from the Voyager ILS while the usage data was itself a hybrid created from multiple sources. Putting together the financial data and usage data from two separate spreadsheets required a match point to merge both sets of data. The most effective match point was found by using the Database Code from the 360 ERMS as a unique identifier.

CPU calculation was easily done by creating a column with an Excel formula that returned the value. The more complicated factor was determining what constituted a 'use' for a database. The COUNTER R4 DB1 report presents four metrics: searches (regular and federated), result clicks, and record views. To simplify the reporting that was presented to the subject librarians, we chose one usage metric for each database, and calculated CPU based on that. In most cases, record views were the preferred usage metric from the DB1 report. Searches was used for some databases due to varying reasons: if it was a better measure of the user experience with a database, to ensure continuity for past years where searches had been the CPU metric, or to ensure equal comparisons within disciplines where searches was the preferred usage measure.

In reporting the usage on the spreadsheet, a separate column displaying the usage metric was included for each year. In this way, subject librarians could have a better understanding of what usage meant for each individual database. It also illuminated changes in reporting usage year to year, so if the measure was Searches one year and Record Views in the next, the spreadsheet would clearly reflect this change. Additionally, by providing transparency on the usage metric being used for CPU, subject librarians could provide feedback in cases where more appropriate metrics could be used.

Once everyone understood the various ways of calculating and understanding usage, and how the usage statistics shade the meaning of the CPU, subject librarians were able to group the resources into tiers representing cost value to the collection. Tier 1 titles were most valuable because of the lowest CPU - high usage with high value despite high cost, Tier 2 titles were of secondary value, and Tier 3 titles were potential cancellations.

Communication with users was critical to maintain transparency and good will with library users. By creating this objective metric, subject librarians were able to communicate to university faculty a rationale for potentially cancelling each resource which avoided subjectivity. Each subject librarian presented this analysis to the faculty of their school, explained the mandate, the process for reaching the cut, and which titles were candidates for cancellation. If faculty had concerns about a cancellation, these concerns were discussed, and consensus was reached about the cancellation.

The success of this project was determined first by the library's ability to cancel the appropriate number of databases to reach the financial goal. The library not only developed a list of Tier 1 databases which it would cancel, but it also identified titles to watch in subsequent years. Second, success was measured by the least impact on users. The library emphasized the importance of communication with stakeholders from the initial phases of the project. As a result, the library received no pushback from faculty or other users. This collaboration built trust and confidence in the process.

Subsequent Phases – Considerations, Challenges, and Opportunities

Because of the initial success of the serials review project, the Technical Services department expanded this CPU analysis to include a holistic assessment of e-resource collections. This more holistic assessment included expansion into three areas: additional formats, better COUNTER statistics, and qualitative analysis. Reporting e-journal usage had been done at AU Library in previous years, though not with regularity. While it was relatively straightforward to take our existing template for assessing databases and apply it to e-journals, because the majority of AU's e-journal subscriptions are tied to multi-year "Big Deal" contracts with the larger publishers, cancelling individual subscriptions is not always possible.

Additionally, during this next phase we began assessing e-book usage for the first time. We acquire e-books through multiple models of acquisition, including firm purchases of single titles, frontlist packages, demand driven acquisition (DDA), and shared consortial purchasing. Our initial e-book assessment sought to capture our e-book purchasing activity from 2009 to 2016.

E-book assessment provided new challenges in both compiling and presenting data. We began by breaking down our e-book collections at the vendor level. Identifying one vendor at a time, we'd determine how to break down what we had from that vendor, e.g. package/frontlist/subject level, see how our expenditures broke out along these collection lines, and then identify how usage could be matched to collection to arrive at CPU calculations.

Pulling e-book acquisitions data from the ILS was complicated; inconsistencies in how e-book purchases were handled and multiple changes to the ledger structure over time required several queries to get a complete picture of historical e-book purchases. For usage, we relied on the COUNTER R4 BR2 reports, when available, as they provide a more granular measure of usage in Section Requests. In the simplest cases, we would take the total spend for a vendor, aggregate the complete title usage from the vendor, and come up with a CPU figure based on that. For subsequent years, the CPU figure was based on cumulative usage per year, effectively showing the value of the collection purchase increase over time. However, some vendors only supply BR1 reports, which only measure usage at the title level. This inconsistency of data makes analysis across platforms challenging.

Whenever possible, we also wanted to show more granular data. In some cases, it was possible to work with the vendor to get subject-level breakdowns of spending and usage and incorporate this into our reporting. For our DDA usage, we pulled out the annual spend for the DDA program, then matched that against cumulative usage figures every year. In a future phase of this project, we hope to conduct deeper assessment of DDA, including: subject analysis of triggered titles, tracking usage over time, and measuring how long titles are available prior to being triggered.

The implementation of COUNTER Release 5 brings with it new opportunities, as well as new challenges. In terms of opportunities, the revisions to the code of practice allow for both greater granularity in measuring usage, as well as greater accuracy. One way that COUNTER R5 is more accurate is that it now distinguishes user actions into two types: investigations and requests. An investigation refers to any type of activity related to a content item, whereas a request is an actual download or view of the content item (Pesch 2017). For example, an investigation could be an abstract view, an html article preview, or a full-text PDF download. But a request only counts when an action is actively taken on the user's end, such as a full-text download or viewing of a streaming video. As far as this relationship goes in terms of usage measurement, all requests are counted as investigations, however, not all investigations are requests.

This distinction between investigations and requests provides more accuracy in measuring active user behavior and guards against what is sometimes known as the "interface effect" (Davis & Price, 2006), where some e-resource usage measures are influenced by the platform's user interface. For example, in some cases a user will go to an article and be automatically presented with the HTML full-text, as well as the option to download the full-text PDF. Such an action would be counted twice as an article request; another platform that first presents the user with an article abstract would not count an article request until the user clicked on a full-text option. COUNTER R4 strove to capture this distinction by separating out HTML and PDF article requests, though it also counted the sum as total article requests. Libraries may have been more likely to use the total article requests metric for CPU, either because it intuitively seemed like the preferable metric or to facilitate comparisons across e-resource platforms where user interfaces would not be consistent. COUNTER R5 reports in fact do away with separating out HTML and PDF requests with the hoped for result of providing a clearer measure with investigations and requests.

Another way in which COUNTER R5 has moved to increased accuracy is the removal of Gold OA e-journal articles from default journal article reporting. In COUNTER R4, the JR1 counts included Gold OA articles; a separate report, the JR1 GOA, counted just usage of Gold OA articles. If an accurate CPU of paid for content was to be derived, the usage from the JR1 GOA would have to be subtracted from the JR1. In COUNTER R5, the default e-journal reporting removes Gold OA articles, so an accurate reporting of subscribed e-journals can be gleaned from one report instead of a calculation based off two reports.

The reporting of e-book usage in COUNTER R5 has also been streamlined for greater accuracy. The TR_B1 report distinguishes between Unique Title Requests and Total Item requests. For example, if an entire e-book with 15 separate chapters is downloaded chapter by chapter from a platform, the number of Total Item Requests would be 15, for each chapter, but the Unique Title Requests would remain at 1. This is another way of correcting for the "interface effect," as some platforms allow users to download the entirety of an e-book while others make chapters or sections the unit of download. Cross-platform analyses are facilitated as a one-to-one comparison can be shown, even when one platform has a user download 15 individual chapters and another an entire book download. In COUNTER R4, these distinctions were measured through different reports; BR1 showed entire book downloads, BR2 showed chapter or section requests. However, not all publishers produced BR1 reports if their user interface didn't allow for entire book downloads. With TR_B1 in Release 5, libraries are better equipped to make comparisons across platforms and publishers in a single report.

The revised measures in COUNTER R5 also carry the potential for new challenges in assessment. As the measures for usage become more refined, libraries will be presented with decisions on how to define CPU calculations to reflect these usage definitions. For example, if a library was using total full-text article downloads from the Release 4 JR1, in the Release 5 TR_J1 report, they would have the choice of using Total Item Requests or Unique Item Requests. If year to year consistency was desired in making usage comparisons, libraries may opt to use Total Item Requests, which would be more in line with the Release 4 stats. However, that would mean forgoing the theoretically more accurate measure of Unique Item Requests, which would likely be more valuable to use going forward. For the most part, measures from Release 4 can easily be mapped to Release 5, which allows for consistency. Although if a library was using either full-text HTML or PDF article requests to calculate CPU, that measure would not be available in COUNTER R5. Overall, the moves toward greater accuracy in COUNTER R5 should present a net positive for libraries; however, it is also potentially problematic for consistency of year-to-year collection analysis.

Further complicating matters, despite the mandatory January 2019 implementation date for Release 5, not all publishers have met this deadline. Usage fluctuations brought on by the R5 transition can be more easily interpreted when they are uniformly occurring with 2019 usage stats. However, if publishers do not become R5 compliant according to the implementation timetable, libraries may see these expected fluctuations happening across scattered titles later in 2020, or beyond.

It may be inevitable that libraries witness a stark shift in their usage data brought on by the R5 transition. Although it's not required for COUNTER compliance, publishers have the option to continue making R4 reports available. This window of overlapping reporting may be useful in the interim to ease the transition. Comparing R4 and R5 reports for the same reporting period can be instructive for selectors to illustrate the changes in R5. Additionally, libraries can calculate ratios between R4 and R5 metrics, for example, Record Views to Total Item Investigations when measuring database usage. Potentially, that multiplier can be applied retrospectively to bring the R4 numbers of previous years more in line with current R5 numbers. This would be a possible solution for libraries looking to smooth out longitudinal analysis for time spans covering the R5 transition.

Regardless of the current COUNTER release and usage metrics, CPU does not fully convey all aspects of value of a title. Universities are increasingly demanding that each academic area demonstrate that financial resources are not only spent effectively, but that the purchased resources have demonstrated value through impact or VOI. Collection assessment must include impact on research productivity which impacts university status and standing. Oakleaf identifies the areas of impact assessment as publication output, citation impact, grant awards, textbook publication, institutional repository deposits, and conference presentations (Oakleaf, 2010).

Further, determining value based solely on cost, usage or even CPU, ignores the context of larger library strategic goals. Determining value based on qualitative measures can provide that context. In FY2019, we developed a rubric for assessing each resource based on a resource's significance to meeting curricular needs, active faculty research, or university strategic initiatives such as new and expanding academic programs and institutes. Each resource is assigned a high of 3 points for most relevance down to 0 points for no relevance. An assessment of the success of this aspect of the assessment is forthcoming.

Conclusion

Collection evaluation is a critical piece of collection development. Faced with competition for scarce financial resources, librarians must develop metrics for measuring the value of library resources based on both sound fiscal decision-making and qualitative factors. Together quantitative and qualitative measures provide a holistic picture of the value of the library's collection to its users and to the university. Further research needs to be done on how to measure value as well as how to measure impact. Future assessment projects at AU Library will expand to include the impact of the library's collections on the success of the students, faculty research and status of the university.

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