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Getting ahead of the curve: an investigation into how the Caltech Library succeeds in resource sharing (paper presented to the IFLA Interlending and Document Supply Conference (Paris, 2017)

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Getting ahead of the curve: an investigation on how the Caltech Library succeeds in resource sharing

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Abstract:

This paper will address the challenges faced by the California Institute of Technology (Caltech) Library, its history in supplying research materials to its community, and the significant shift in its collections strategy in 2015 that directly affected how the Library would continue to provide information resources to its students, faculty, and staff through resource sharing. Prior to 2015, the Caltech Library had approached procuring information resources for its campus community in a hybrid model that married together the typical academic library process of interlibrary loan with a business or special library practice of purchasing material and charging users for the service. Based on a number of factors in 2015, this process shifted to a multi-faceted approach that utilized an increased use of consortia, mediated article purchasing, and an unmediated article acquisition process where our users can decide whether to use the normal interlibrary loan process or a "rush" alternative. This included embedding the unmediated rush option within search engines such as Web of Science and Ebsco Discovery Service (EDS). This paper will share the findings of this strategic change and the outcomes based on the data.

Keywords: academic libraries, interlibrary loan, resource sharing, interlending.

Introduction

As journal subscription prices annually increase, library budgets may not be able to meet those inflation-level increases. The financial deficit between what a library can afford and the actual cost of information resources can create difficult examinations within the library on what resources the library needs to continue to maintain subscription access to for its users and what could be canceled and acquired in a different way.

Libraries are also being called upon to offer different types of spaces within their buildings. These include maker spaces, media spaces with data visualization technology, and collaboration rooms. To make way for spaces like these, print materials can become strong candidates for removal. For libraries with offsite storage capacity, the relocation of print materials may not pose a threat. However, for libraries with little or no other storage options, the need for spaces presents a similar challenge to increased journal subscriptions costs. The need to remove materials can trigger an earnest review of what can go and what must stay.

When academic libraries present these difficult collection issues to their communities, resource sharing or interlibrary loan is often singled out as a viable option to fill their potential information needs. This requires an interlibrary loan department with many tools and a commitment to creatively thinking about how to provide information resources to its community. The purpose of this paper is to examine the California Institute of Technology (Caltech) Library's experience and the direct effects journal subscription cancellations and journal withdrawals had on its interlibrary loan unit. The focus of the study will be exclusively on journals and their articles, not monographs.

Caltech is a private research university enrolling approximately 2,200 students at the undergraduate, graduate, and doctoral level. In addition, Caltech has nearly 300 professorial faculty and more than 600 post-doctoral research scholars. Caltech has been considered a leading research institution and its faculty and alumni have been recognized with a number of academic honors, including 35 Nobel Prizes ("Caltech at a Glance," 2016). The Caltech Library has a staff of approximately 48 librarians and staff. Interlibrary loan and document delivery services are provided to Caltech students, faculty, and staff through a library unit called DocuServe, which is staffed by four full-time staff.

Prior to 2015

While this study focuses on major journal cancellations and print journal withdrawals that occurred in 2015, it is important to understand how the Library and DocuServe operated in the prior years. The DocuServe operation was similar to other interlibrary loan units in that it evolved from photocopying to scanning, uses the Atlas ILLiad application, and is involved in a number of resource sharing consortia. Caltech's research stature is at a higher level than the size of its library collection. This mean that the Caltech Library has always sought different ways to address the content gap between its collection and user needs.

Since the 1990s, the Caltech Library had charged its users a fee for any interlibrary loan or document delivery request. This included articles, books, book chapters, theses, patents, or conference reports. The price increased over time and by 2015, it was $6.50 for returnable loans and $6.50 for each thirty pages of a non-returnable request (articles or book chapters). While the fee created a stream of cost-recovery income for the Library, the added fee to users compelled them to consider if the requested material was worth the cost.

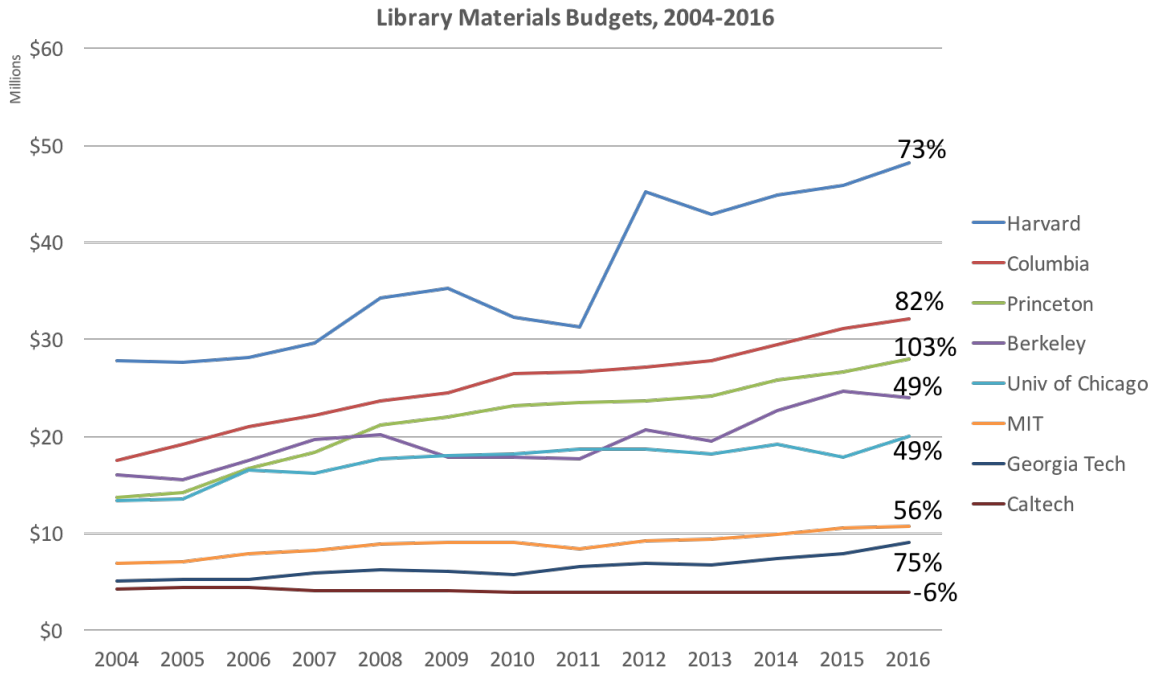
If a Caltech student, faculty, or staff was paying for the service, it was also a duty of DocuServe staff to fulfill the request in the shortest time period possible. This was one reason why all DocuServe staff had purchasing credit cards and the ability to purchase articles or book chapters directly from publishers or vendors. In addition, the Caltech Library had established relationships with individual lending partners and vendors by placing monetary deposits with them to ensure a fast turnaround on interlibrary loan requests.

In 2010, the Caltech Library purchased a back file holdings of several journal titles. The Library held much of these titles in print and was able to deaccession the volumes to create additional study spaces. In addition, the electronic accessibility of these journals reduced document delivery requests made by Caltech users to DocuServe, which previously would pull the print volume, scan the article, and deliver it via email. Instead, the community would be able to electronically browse these journal runs.

The Library's materials budget remained flat from 2004 to 2016 (see figure 1). As journal subscription rates increased each year, the purchasing power for the Library was reduced due

to the static budget. Factoring in annual inflation rates, the Library estimated a reduction of 70% in purchasing power through the past decade. This caused annual gaps between costs of content with increased subscription rates and the actual budget. These deficits were filled by reducing print monograph purchases, eliminating staff positions, or delaying filling vacant staff positions so salary savings could be moved to the collections budget. Addressing these budget deficits in this manner was not a sustainable method and the Library began investigating a more feasible solution.

Figure 1: Caltech and Peer Libraries Materials Budget: 2004-2016



Changes in 2015

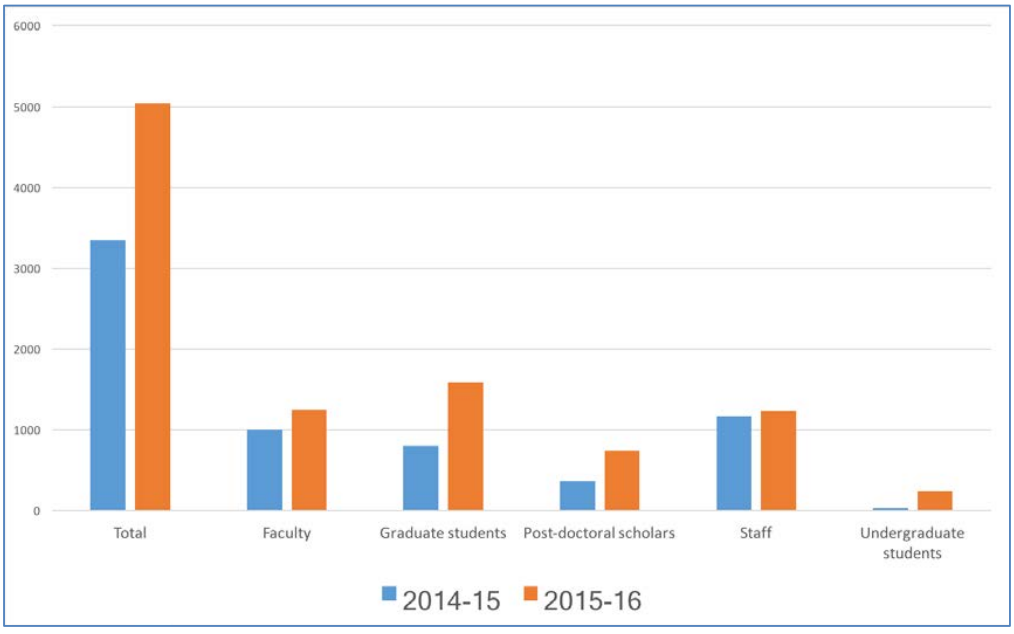
Beginning in 2015, the Caltech Library experienced a number of changes that set it on its current path of reframing its model for content accessibility and resource sharing. This began with a change in leadership. The previous University Librarian had retired in 2014 and the new University Librarian joined the Library in late 2014. The new University Librarian displayed a willingness to challenge the status quo of how libraries operate within the structure of the information resources supply chain.

One of the first changes was to share the true costs of library resources with Caltech faculty. This included sharing the cost per download of articles accessed through the Library's journal subscriptions and the cost to "borrow" an article through interlibrary loan. The cost per download from journal subscriptions was calculated by dividing the cost of the journal subscription by the number article downloads. The costs per download varied significantly between journals. Some journals with very high usage resulted in a cost per download of only a few dollars and others, with very little usage, had cost per download rates of several hundreds of dollars. Calculating the costs to acquire an article through interlibrary loan factored in a number of elements, including the lending library's fees, OCLC fees, ILLiad costs, and DocuServe staff labor costs. This average cost was determined to be approximately $12.50.

DocuServe expanded its resource sharing partnerships to include RapidILL (http://rapidill.org). Designed by the interlibrary loan staff at Colorado State University Libraries, RapidILL provided DocuServe with a group of libraries to call upon for journal article requests. Their mission to provide fast turnaround time for article fulfillment mirrored DocuServe's same goal. The Caltech Library also entered into a relationship with Reprints Desk (http://info.reprintsdesk.com/), a company that provides scholarly article pay-per-view service to corporations, law firms, special libraries, and academic libraries.

After receiving feedback from a number of members of the Caltech community, including graduate students, post-doctoral research scholars, that the DocuServe fee impeded access to scholarly information, the University Librarian decided to remove the $6.50 charge on all interlibrary loan borrowing. Another factor was the recognition by Library administration that a larger number of journals would be cancelled in the future. The Library administration considered it unfair to force the Caltech community to pay for material that they had access to in the past. The change in policy had an immediate impact as overall article borrowing increased by 48% in one year with undergraduate students, graduate students, and post-doctoral scholars accounting for most of the increase (see figure 2). The academic year for this study was defined as July through June.

Figure 2: Interlibrary loan article borrowing during the academic years 2014-15 and 2015-16



For decades, the Caltech Library occupied an on-campus storage facility for low-use materials in the subbasement of a laboratory building. The space known on campus as the annex was closed to the Caltech community and material was requested through the Library. Needing space for additional laboratories, the Caltech administration directed the Library to vacate this space. The storage space housed full or partial runs of 2,247 journals as well as thousands of technical reports, Caltech's dissertation collection, and a limited number of monographs. Approximately, one-third of the Library's overall print collection was stored in this space.

With a short timeframe and limited space in other library locations on campus, hard decisions had to be made on what could be kept and what would have to be withdrawn. The Library staff created an inventory to share with the faculty to gather feedback. Annually, the Caltech community made 1,500 requests from the 100,000 physical volumes in the annex. Holdings data was also analyzed for coverage of these materials across resource sharing partners. In addition, there were some journal titles that Caltech had access to through back file purchases of the electronic content. After considering the feedback, holdings available elsewhere, and duplicate print/electronic holdings, the Library retained 513 journal titles and relocated them to other library locations on campus. Another 24 journal titles were retained and relocated to an offsite storage facility. The remaining 1,710 journal titles were withdrawn from the Library's collection and recycled.

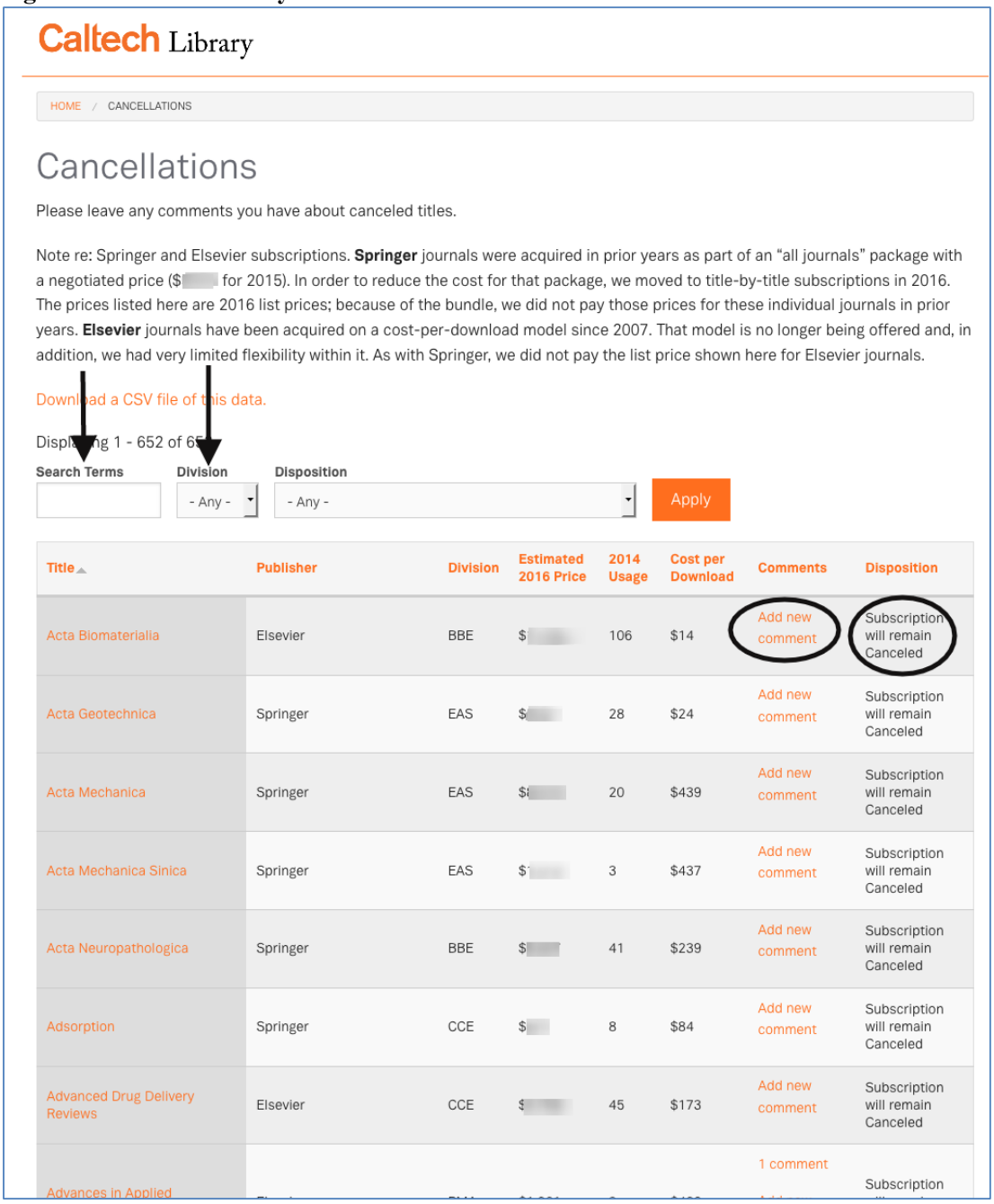
The biggest change in direction was aligning the financial constraints of the Caltech Library with the changes in academic publishing. As noted above, the library budget had not been funded to cover actual inflation from 2004-2014 (see figure 1). The budget situation for 2015 would be similar. Journal pricing can be opaque but Caltech is typically charged at a high tier due to its advanced research intensity. This resulted in a higher cost per download when compared to peer institutions because of the smaller number of faculty and students. Based on this financial reality, the Caltech Library decided to rethink the whole content investment model. This included extracting the Library from inflexible "big deals" with publishers and reducing the overall number of journal subscriptions. Essentially, the Library shifted from a "*just in case*" model of content accessibility, where the Library acquires information resources just in case they are needed, to an "*on demand*" access model which would provide the content precisely when needed.

Strategic Realignment

The shift in philosophy on how content would be provided to the campus community required a review of all journal subscriptions as well as a commitment to supporting DocuServe as a vital partner and practical alternative to the journal subscription model. This required that a feedback process be established between the Library and faculty. A website was created to explain the financial constraints of the Library and announce the strategic realignment in how resources would be accessed.

The Caltech Library made the decision to break out of the largest of its bundled packages that grouped hundreds of journals together for a lower price and shifted to a title-by-title subscription approach which provided flexibility on which journals keep or remove. The Faculty Library Committee, which advises the University Librarian, recommended reviewing journals with a cost per download threshold of $10 and above. The resulting 652 proposed journal titles were listed on a website that included the journal title, related academic division, publisher, estimated 2016 list price, 2014 usage, and cost per download (see figure 3). Faculty were able to sort by their academic division and add comments on specific journals. Based on faculty feedback, 36 titles were taken off the cancellation list. The remaining 616 journal titles were cancelled. The real dollar savings to the Library on these cancellations was approximately $450,000.

Figure 3: Caltech Library's Cancellations website



Caltech Library

HOME / CANCELLATIONS

Cancellations

Please leave any comments you have about canceled titles.

Note re: Springer and Elsevier subscriptions. **Springer** journals were acquired in prior years as part of an "all journals" package with a negotiated price ($ for 2015). In order to reduce the cost for that package, we moved to title-by-title subscriptions in 2016. The prices listed here are 2016 list prices; because of the bundle, we did not pay those prices for these individual journals in prior years. **Elsevier** journals have been acquired on a cost-per-download model since 2007. That model is no longer being offered and, in addition, we had very limited flexibility within it. As with Springer, we did not pay the list price shown here for Elsevier journals.

Download a CSV file of this data.

Displaying 1 - 652 of 65

Search Terms | Division | Disposition | Apply

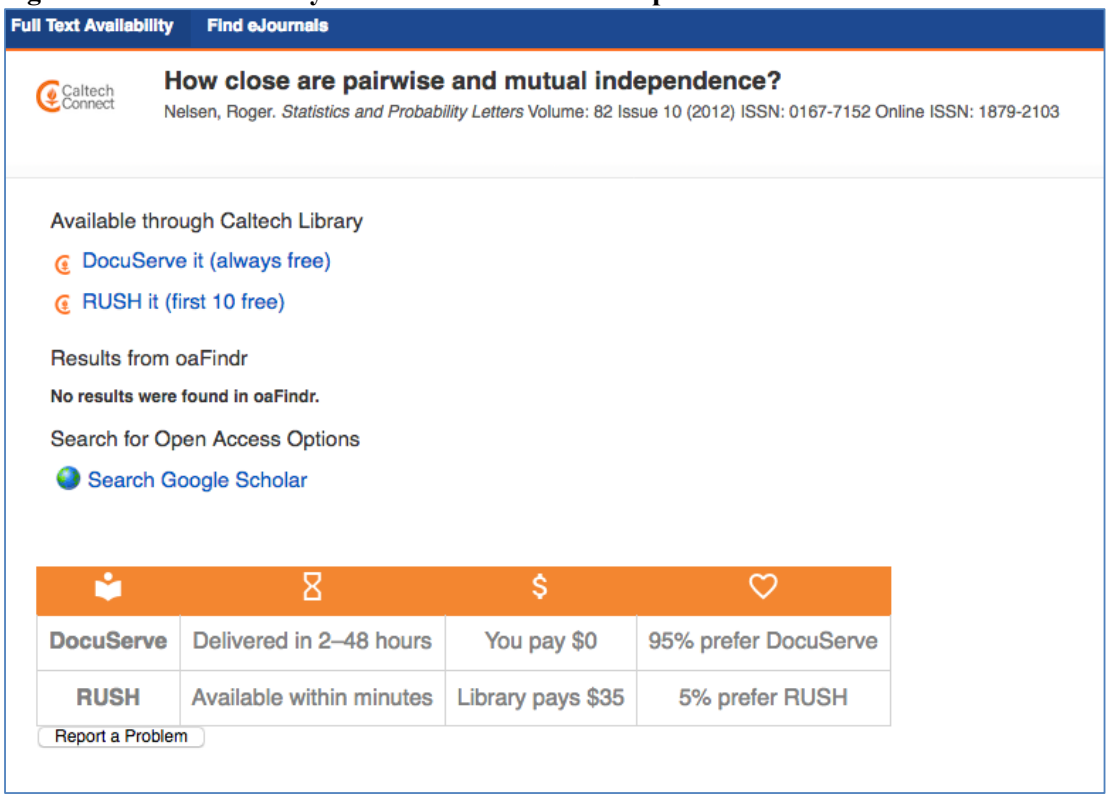
Title	Publisher	Division	Estimated 2016 Price	2014 Usage	Cost per Download	Comments	Disposition
Acta Biomaterialia	Elsevier	BBE	$	106	$14	Add new comment	Subscription will remain Canceled
Acta Geotechnica	Springer	EAS	$	28	$24	Add new comment	Subscription will remain Canceled
Acta Mechanica	Springer	EAS	$	20	$439	Add new comment	Subscription will remain Canceled
Acta Mechanica Sinica	Springer	EAS	$	3	$437	Add new comment	Subscription will remain Canceled
Acta Neuropathologica	Springer	BBE	$	41	$239	Add new comment	Subscription will remain Canceled
Adsorption	Springer	CCE	$	8	$84	Add new comment	Subscription will remain Canceled
Advanced Drug Delivery Reviews	Elsevier	CCE	$	45	$173	Add new comment	Subscription will remain Canceled
Advances in Applied						1 comment	Subscription

In conjunction with the journal cancellations, the library administration devoted some of the journal savings to DocuServe to assist with the expected increase in interlibrary loan borrowing. Feedback from faculty was very positive about the fast turnaround time from DocuServe but the staff did not work on evenings and weekends so any request made during those time periods would have increased delay in fulfillment. The additional investment in the DocuServe unit was in used to introduce an unmediated article supply option,

administered by Reprints Desk. The "RUSH" option, as it came to be known, was designed available through the Library's discovery service.

If a user searched for a journal article that the Caltech Library did not have access, through an EBSCO Full-Text Finder driven service window, the user is presented with the DocuServe and RUSH options (see figure 4). When a user selects RUSH, a Reprints Desk web form opens with the article's metadata populated. The user is required to add their name, Caltech email address, and click submit. Usually within minutes, Reprints Desk email the user a URL to download the article. The service was introduced in May 2015 and evolved based on user feedback. Beginning in October 2016, users can make ten RUSH requests per year for free. On the eleventh, and each subsequent request, the user is charged $15. The $15 fee partially subsidizes the Reprints Desk costs and serves as a mild deterrent to users to not overuse the service. Reprints The Caltech Library receives a monthly invoice from Reprints Desk on the article purchases made in the prior month.

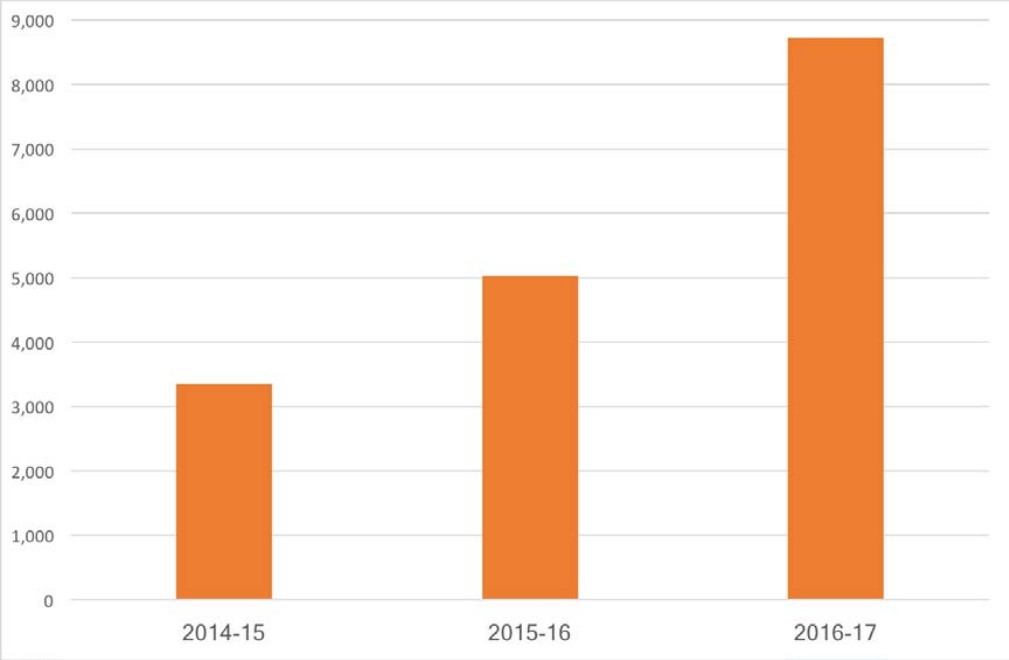
Figure 4: Caltech Library's DocuServe and RUSH options



Findings

After eliminating the interlibrary loan fee, cancelling over 600 journal titles, and removing 1,710 journals from the print collection, the expectation within the Caltech Library was DocuServe would experience a sharp increase in interlibrary loan article requests. This did in face happen as a review of the past three academic years shows (see figure 5). Between the academic years of 2014-15 and 2015-16, there was a 48% increase in interlibrary loan article borrowing and a 73% increase between 2015-16 and 2016-17 academic years.

Figure 5: Interlibrary loan article borrowing by academic year



Based on data of article borrowing, the Library inferred that the increase was based primarily on two factors: undergraduate students, graduate students, and post-doctoral scholars continuing to grow familiar with using DocuServe as a free service and new requests for content from the recently canceled journals. It was expected, and later confirmed, that the print materials removed from the annex would have a negligible effect on interlibrary loan. Nearly all of the usage from annex materials was from the 513 journals retained and relocated elsewhere on campus.

Based on the interlibrary loan data collected during the 2016-17 academic year, when the content from the canceled titles was no longer accessible, the number of borrowing requests was much lower than originally expected based on prior usage. Of the 8,728 interlibrary loan articles borrowed, only 651 (7.5%) were from the canceled journal titles. Additionally, the 651 articles requests came from only 239 canceled journals. The other 377 (61%) of canceled journal titles did not receive a single interlibrary loan request from the Caltech community during the year.

It should be noted that, for a vast majority of the 616 canceled journal titles, only the content from 2016 and subsequent years was canceled. The Library had electronic access for the years the Library subscribed. In other words, if the Caltech Library subscribed to "journal X" from 1995 through 2015, the content from 1995 to 2015 would remain electronically accessible to the campus community. Because of this, the 651 interlibrary loan article requests are almost entirely 2016 and 2017 content. With each passing year, the inaccessible content from these canceled journals will increase. For example, in the 2017-18 academic year, articles published in 2016-18 will not be available to the Caltech community. Thus, for

the 2017-18 academic year, DocuServe expects 15% of interlibrary loan articles borrowed to be 2016-18 content published from the 616 canceled journals.

A major reason for expecting that there would be a dramatic increase in article borrowing from the canceled 616 journals was the usage data supplied by the vendors or publishers of these canceled journals. For the sake of this study, usage data was defined as PDF file downloads of articles from subscribed journals, as reported in the counter JR5 reports. In 2015, the usage data showed 13,040 article downloads of 2015 content from these 616 journals. The 651 interlibrary loan article requests from these canceled journals during the 2016-17 academic year only equated to 5% of the 2015 usage. The discrepancy between the article usage through subscriptions and the interlibrary loan article requests could be attributed to a number of known and unknown influences.

How a publisher collects or defines the usage type could be a factor (Li and Wilson, 2015). It could be possible that content providers define usage in a very broad way. Users may download an article as a form of browsing just as they might pull a book of a shelf, flip through its table of contents, and place it back on the shelf. The same user could also download the same article multiple times instead of saving the file to their computer.

Another element that could explain the disparity between anticipated interlibrary loan article requests could be how users choose to acquire unavailable articles. One cannot simply assume that users will use interlibrary loan as the only alternative to subscription access. A survey[1] conducted by the Caltech Faculty Library Committee explored this topic with faculty, graduate students, and post doctoral research scholars:

What are you most likely to do when the Caltech Library does not have what you are looking for? (select up to three):

- 55% would request the article from DocuServe
- 40% would search the web or self-arching databases
- 25% would give up, attempt to work without that article, or find a close alternative
- 22% would request a colleague at another institution obtain the article on their behalf
- 15% would request a copy of the article from the article's author(s)
- 10% would search password protected article sharing sites like ResearchGate
- 7% would search Sci-Hub

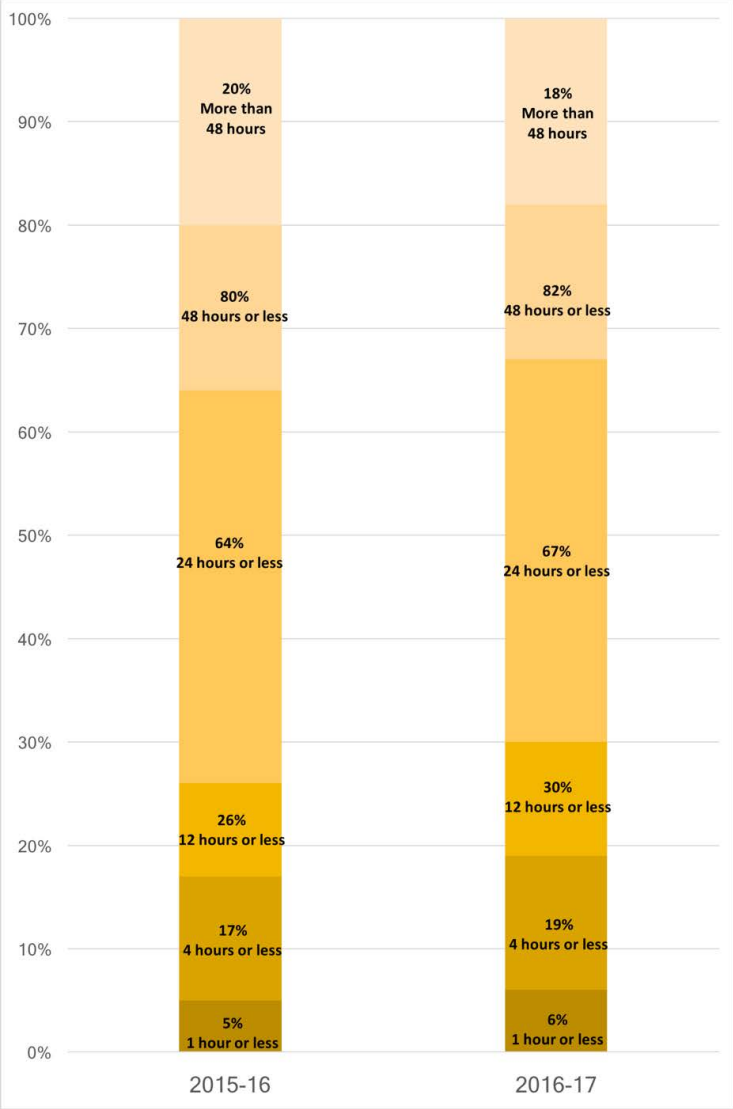
Because the canceled journals turned out not to be a primary source of the dramatic increase leaves only one likely explanation for the significant rise in interlibrary loan article requests: an increased awareness of the service amongst the populations who were now able to request numerous articles to review instead of worrying about a $6.50 or more charge per article. Feedback from these populations indicated their pleasant surprise at how quickly articles were delivered to them. The expectation from the Caltech Library is that the increase in borrowing requests from students and research scholars will level off as these campus groups grow accustomed to the free service.

A quick turnaround time has always been a primary goal of DocuServe. Removing the fee had no impact on the DocuServe staff's effort to deliver requests in the minimal amount of time possible. However, there was a concern that a substantial increase in the volume of

[1] Survey was conducted in July 2016.

requests could negatively affect the turnaround time. The Library's decision to join RapidILL was one way to give DocuServe staff additional resources to fulfill interlibrary loan requests in a short timeframe. Furthermore, additional staff from the circulation unit were trained on interlibrary loan processes and assisted when available. Even with the significant volume increases of requests, the DocuServe staff were able to slightly improve upon the fulfillment times between 2015 and 2016 (see figure 6).

Figure 6: Interlibrary loan article borrowing by turnaround time, 2015 and 2016.



In 2015-16, on average, DocuServe would fill an interlibrary loan article request in 28 hours and 14 minutes. Even with a 73% increase in interlibrary loan article requests, in 2016-17, DocuServe staff were able to improve the average turnaround time by 9% to 25 hours and 46 minutes.

The RUSH option received very positive feedback from a user survey, though 98% of requests were filled by interlibrary loan. Feedback from the campus community highlighted the ease of use of the service and the quick turnaround time to receive an article. Reprints

Desk was able to fill 50% of all requests within 10 minutes and 83% within an hour or less. The overall average turnaround time was 21 minutes. Nearly 90% of all RUSH requests were successfully filled by Reprints Desk. The remaining 10% would be sent from Reprints Desk to DocuServe to fill through traditional interlibrary loan.

The RUSH option was available for any journal title not available through Caltech Library. This would include the recently canceled titles as well as content to which the library never had print or electronic access. Though the use of RUSH increased in Spring 2017, the projected usage is still only 2% of the total interlibrary loan article requests. At the current rate, the expected cost of offering the RUSH service to the Caltech Library will be approximately $2,000 per month. Requests for articles from canceled titles accounted for only 10% of the total RUSH requests. This is proportionally higher than the interlibrary loan article requests (7.5%) from the canceled journal titles, reflecting greater time sensitivity in the needs for recent published content.

Next steps

Content review is an ongoing process and, as the materials budget remains flat, the Caltech Library will continue to emphasize an "on demand" model of access for articles from low value journals (i.e. high cost per download), while ensuring the most relevant and needed journal titles will continue to be electronically accessible immediately through subscription. As the Caltech Library cancels additional journals, data will continue to be collected and analyzed to assess the impact on the resource sharing operation within DocuServe. To maintain the overall quality of accessibility, the Library will continue to investment in DocuServe. The stability of the interlibrary loan document supply model, as libraries cancel subscriptions and as publishers increase per article costs, remains a concern.

Conclusion

When financial or space constraints affect what a library can collect, a library must recalibrate its priorities and explore different avenues for content access for its users. The networking of libraries have afforded them with reliable alternatives. A successful interlibrary loan operation allows a library administration the ability to rethink its role in how it provides content. In 2015, the Caltech Library explored such a strategic shift and chose to invest in resource sharing instead of trying to meet annual budget gaps that result from flat collection budgets and rising journal subscription costs.

While the Caltech Library saw considerable increases in its interlibrary loan article requests over two years, data analysis shows that the vast majority of the increase was not the result of journal cancellations but the result of a simple policy change to not charge its users for the use of interlibrary loan. The demand stemming from calcined titls is below expected levels. This could be due to a number of factors, including poor subscription decisions, inflated usage data, and users choosing alternate methods to acquire the material.

In short, while interlibrary loan cannot replace a journal subscription in terms of ease of access, it can be a viable and cost-effective alternative for lower-used titles or subjects outside the scope of a library's collection. As libraries review their content needs in light of their budget realities, more emphasis should be placed on whether the "just in case" collection model is still a good fit.

Acknowledgments
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