Managing Discovery Services: Case Studies at Simon Fraser University (Summon) and Acadia University (Primo)

By Leanna Jantzi, Jennifer Richard, and Sandra Wong.

Leanna Jantzi is Head of Fraser Library at Simon Fraser University. ljantzi@sfu.ca
Jennifer Richard is Academic Librarian at Acadia University. jennifer.richard@acadiau.ca
Sandra Wong is Electronic Resources Librarian at Simon Fraser University. swongj@sfu.ca

Introduction

The progression in libraries from disparate finding systems that needed to be searched separately, for example library catalogs, abstracting and indexing tools, and databases, to federated search, to web-scale discovery systems (WSD) has been well-discussed and considered. Google and other web search engines have also had an impact on library users' concept and application of search.[1] The tension between user expectation and behavior and the capabilities of WSD and those who develop and maintain these systems is defining current electronic resource management (ERM).

User interaction and the promise of WSD has brought the role of ERM to the fore in libraries. ERM is changing workflows and impacting department structure.[2] WSD and substantial collections of electronic resources have blurred the distinction between technical and public services. Increasingly, libraries view technical services and public services working together on ways to best implement and present WSD.[3] Moreover, staff members in technical services are finding themselves part of decision-making processes that implement, maintain, and improve WSD.[4]

It is difficult to argue that Google and other search engines have not had a direct impact on libraries and library users. A single search box that returns a consolidated list of results, with links that lead directly to information has become a standard expectation and created a familiar environment for all searchers:

> "The advent of Google made one-box searching easy with result sets that seemed to be precisely what the searcher had in mind. Thus, the 'Googlized' library patron was born. This patron – our patrons – will no longer tolerate anything more complex than a single search box and a single, integrated results set."[5]

And, of course, as Thomsett-Scott and Reese note, "The development of Google Scholar in 2005 was definitely another impetus for librarians to move from federated searching to something faster and more comprehensive."[6]

Not only have users' expectations changed, so has their pattern of search. Prior to WSD, a complete (or very close to complete) citation was required in order for a journal article to be found. Now, with WSD, only a partial citation is needed (perhaps one author and a fragment of a title) and the item can be surfaced in WSD. Therefore, libraries' A-Z journal lists are moving to the background of public use while the knowledge bases that populate A-Z lists remain integral to WSD services.

Now, rather than relying upon a complete refinement of a research query, users of WSD use multiple, simple keywords to fulfil their information need, reflecting the same environment of a web search engine. Moreover, users can conduct a search that produces a long set of results, but can then refine using the facets available.[7] This post-search refinement is directly opposite of the long-held search formula of refining and narrowing a query pre-search. As Georgas found in a study of undergraduate students, "[t]here was little query reformulation."[8] Students also had a "high use of format terms within queries"[9] – an opportunity to leverage the format facets of a WSD service.

These user behaviors and expectations, combined with the possibilities of WSD, have created new questions that are being considered in technical services, all informing how a WSD system is maintained and improved: how often and frequently is the central index updated? How stable is the relationship between the central index and the library's holdings? What is the quality of the metadata in the index? Are format types properly represented? How efficient and accurate is linking? Are current workflows and configurations best suited for this 'new' work?

In this chapter, the authors will present two case studies that investigate many of these questions and discuss not only the implementation of WSD (and in one case, within a consortium), but the implications of managing knowledge bases outside of the selected WSD service, issues of linking and access, and the changing roles of all library staff in the environment of WSD.

Summon at Simon Fraser University Library

Simon Fraser University (SFU) is a medium to large university offering a comprehensive range of undergraduate and graduate degrees located in the Metro Vancouver region in British

Columbia, Canada. In fiscal 2015/2016, the SFU Library's collection budget was just over $10 million Canadian dollars and the library spent approximately 80 percent of this budget on electronic resources.

In late 2009, the SFU Library struck a small task group to investigate discovery layer options for the purpose of finding a unified interface to search the library's collection of print and online resources. The task group recommended Summon and by the fall of 2010, Summon became the default search option on the library's home page. SFU Library also intentionally branded this new service Fast Search on its home page.

SFU Library was able to automate a daily delivery by file transfer protocol (FTP) of catalog updates which included MARC records for physical materials such as print books and media, as well as records for digital resources including e-books, digital collections, and streaming audio and video. However, the library's electronic journal holdings had to be managed in the Serials Solutions Client Center which also acted as the unified index for Fast Search/Summon. This situation meant that the library had to maintain two knowledge bases for its electronic journals, one for Fast Search/Summon indexing purposes and another for its public A-Z journal listing and link resolver. In time for the fall 2010 launch, a snapshot of the library's electronic journal holdings was activated in the Serials Solutions Client Center. However, the library lacked the staff to actively manage two electronic journal knowledge bases on a regular basis. SFU Library's main A-Z journal listing and link resolver known as CUFTS, a home grown and locally developed system, was given the priority. Back in 2010 and through early 2011, indexed-enhanced linking (also known as direct linking) was not yet available in Summon. At that time, all results from Fast Search/Summon were passed through the library's link resolver. Therefore, CUFTS took precedence as the library's primary knowledge base and link resolver which was needed for link resolving in Fast Search/Summon and was already in use in many other licensed databases. By the time index-enhanced linking became available in Fast Search/Summon, the SFU Library made a significant change to its discovery service options.

Library Search at SFU

Public service staff often lamented about the overwhelming number of newspaper articles that seemed to dominate results in Fast Search/Summon. After analysing the terms entered into Fast Search/Summon, SFU Library discovered that users were frequently looking for known items, such as specific journal titles or databases. Users were also entering terms related to

library services, such as building hours, library policies, and course reserves. These circumstances prompted SFU Library to create a tool capable of searching multiple library resources. One year following the implementation of Fast Search/Summon, the library utilized the Summon application programming interface (API) in order to add another layer to the library's homepage. Library Search replaced Fast Search/Summon as the default option on the homepage in September 2011. Library Search offered users a three column snapshot of results from different areas of the library's web-based resources, including Fast Search/Summon. Library Search could find specific journals, databases, material from the library's institutional repository, course reserves, and library web pages, as well as books and media, scholarly journal articles, and newspaper articles from Fast Search/Summon. Figure 1 presents the results from Library Search for "psyc 102" the common abbreviation for a course called Psychology 102.

Figure 1. Library Search results from "psyc 102".

With Library Search, students received a bento box display from different silos of resources from a single search, including course reserves as well as the librarian-developed guide to help students find information to complete assignments for Psychology 102. This same search in Fast Search/Summon would only produce a list of books and articles with words beginning with "psyc" and the number 102. For example, a citation to a meeting abstract called "Endocrine orbitopathy - A new psychosomatic illness? Preliminary research results on the psychosocial factors and quality of life in 102 EO patients" was the third item in Fast Search/Summon. This citation was the first one that contained both terms in the title. However, this reference would likely be of little use for a student taking an introductory psychology course. Indeed, Library Search continues to be the default search option on the library's homepage since its launch in 2011.

Summon management and staffing implications at SFU

The Electronic Resources Librarian (ERL) worked in the Collections Management Office of the library and had sole responsibility for practically all of the library's electronic resources at the time, which involved licensing, acquisition and ensuring access for Authorized Users. With Summon and the addition of a second knowledge base to manage, initial attempts were made to pass along some responsibility of managing the Summon knowledge base to technical services staff whose workloads were declining, in areas such as in check-in and binding. Unfortunately, familiarity with electronic journal publishers and platforms is needed in order to maintain a knowledge base. In the end, the library learned to live with inaccurate electronic journal holdings in the Summon knowledge base. The SFU Library's collection is sufficiently large enough that activating many big deal journal collections and aggregator full text resources was generally sufficient for the majority of users. Changes and corrections were made to the Summon knowledge base when errors were reported by patrons or public service staff. Initially, significant updates were performed yearly in January/February when most journal transfers occurred. Then in 2015 and 2016, some automated updates were performed in bulk four times per year using data from the CUFTS knowledge base thanks to a solution provided by an SFU Library Analyst, who found a way to update the status of Serials Solutions' knowledge base files programmatically.[10]

This situation around managing multiple knowledge bases due to the adoption of the Summon service emphasized SFU Library's need to make strategic decisions regarding staffing

for managing electronic resources. Continued growth in e-book acquisitions and other digital collections significantly increased the ERL's workload. Responsibilities related to electronic resource management needed to be distributed to other areas of the library outside of the Collections Management Office.

A few years later, in 2014, due to a retirement in the area, a vacant position in the Serials Check-in unit was re-evaluated and revised so that some duties performed by the Electronic Resources Librarian could be delegated. This revised position would look after the daily maintenance of the library's electronic journal holdings in CUFTS, which in turn would update in Serials Solutions through the quarterly automated solution. This new position, called a Serials Specialist, is now primarily responsible for managing CUFTS, the library's primary electronic journals knowledge base and provides direct support to SFU students, faculty and staff on accessing electronic journals. This has released the ERL so she can devote time to strategic activities related to managing electronic resources for the library. Even though the Serials Specialist resides in the Serials Unit, which is traditionally a technical services unit, a primary role for this position is to provide public service to both librarians and patrons related to resolving online access to electronic journals.

Communication/Troubleshooting

SFU Library does not have a discovery services librarian or department. Summon was an orphaned service with no home in any specific traditional library unit. Implementation and configuration of the service was done by multiple staff in different divisions at the SFU Library including Library Systems, Cataloguing, and Collections Management. Indeed, after initial implementation, Summon did not really require daily or weekly maintenance, aside from the occasional updates to the library's electronic journal holdings in the Summon knowledge base.

Solving problems related to Summon meant communicating across many library units, and being able to communicate such issues in a manner receptive to each department and their differing priorities. Users and public service staff would report unexpected behaviors from the discovery service, such as failed link resolving or broken links, inaccurate metadata and missing or undiscovered content. Indeed, results from discovery can be unpredictable. The unified index receives updates from many sources: the library's catalogue and knowledge base as well as content from publishers sending their metadata to the discovery service. Depending on the size of any update, it could take a few days to several weeks for Summon to process. The library has

no control over how often and how frequently the central index updated, so holdings in Summon may be out of sync with that of the library. One significant instance of such a delay in Summon updating caused users to find records to e-books in Summon that the library no longer had access to. A subscription to an e-book collection was cancelled, so the library removed the catalogue records, but these records continued to be found in Summon several months later. SFU Library had to open a support ticket to investigate why these records continued to display in Summon even though the cancellation and removal of records had long since occurred. The solution came when the library sent a full catalogue load as a part of a regular quarterly update, and even then, the library was informed that it would still take two to three weeks for this update to be processed.

Frequently, these problem reports would end up in the email in box of the staff person generally thought to be responsible for making electronic resources available. Initially at SFU Library, these reports went to the ERL. In 2014, responding to these general queries was delegated to the aforementioned new Serials Specialist. Anything that the Serials Specialist could not resolve or decipher would then be referred up to the ERL for assistance when necessary. Increasingly, this means that both the ERL and the Serials Specialist continue to provide a specific type of public service, even though both positions are generally in areas usually referred to as technical services rather than public services. The ability to correspond clearly and succinctly to patrons and other library staff as well as to publishers and vendors is a necessary skill. As listed in the NASIG Core Competencies for Electronic Resource Librarians, effective communication is one of the seven core competencies outlined in that document. Competency 4: Effective Communication states:

> "4.1 Communicating effectively, promptly, and consistently, verbally and in writing, with a broad range of internal and external audiences: users, colleagues and staff, subscription agents, and vendors; the ERL must be able to tailor the message(s) to the circumstances and to the audience, as needed."[11]

In a largely digital environment and in a medium to large institution, where management of electronic resources must be delegated to remain sustainable, the activities of technical services staff become more public service oriented since they are frequently the staff who will provide and make accessible the online resources through the library's catalogue, discovery tool, the A-Z journal holdings, and databases.

Primo at Acadia University within the Novanet Consortium

Acadia University is a small primarily undergraduate, liberal arts university located in rural Nova Scotia, Canada serving approximately 4000 undergraduate and graduate students. The library has an acquisitions budget of approximately $700,000 Canadian dollars and over 90 percent of that budget is spent on electronic resources.

Acadia Library is part of Novanet, a consortium of libraries representing all of the higher education institutions in the province of Nova Scotia. Novanet is made up of ten universities and one college system. Novanet provides support for a shared Integrated Library System and discovery service, Aleph and Primo from Ex Libris, in addition to a shared demand driven acquisitions e-book project and a chat reference service.

The search for a WSD service for the Novanet consortium began in 2011 with the creation of a steering committee representing all of the libraries. Although Acadia University was not yet a full member of the consortium, the library was invited to participate in decision making as an associate member. The steering committee invited four vendors to a Novanet Discovery Day to present their products. The participants included OCLC's WorldCat Discovery, ProQuest's Summon, EBSCO Discovery Service (EDS), and ExLibris' Primo. All levels of staff were invited to attend and were encouraged to provide feedback during and after the formal presentations. After all of the product demonstrations, five further subcommittees were struck: Branding, Fulfilment (Document Delivery and Interlibrary Loan Services), Systems and Technology, Central Index, and User Experience.

The impetus for launching a search for a new WSD service stemmed from a number of challenges identified with WorldCat Local at the time. By coincidence, all academic libraries in Nova Scotia happened to be subscribers to WorldCat Local between 2009 and 2014, although not all libraries were full members of the Novanet consortium. Dissatisfaction with WorldCat Local were many among the libraries in Nova Scotia. Libraries expressed frustration with the difficulties around known item searching, slow response times, and problematic results from federated searching. During evaluation, the steering and subcommittees all noted numerous advantages to selecting Primo. The current shared Aleph library system and Relais document delivery system would be integrated and interoperable with Primo. Fulfilment options would be seamless, such as the ability to request a book from another Novanet library directly. Users

would be able to search course reserves in Primo. Relevance ranking, de-duplication and FRBRized records were also offered in a Primo environment.

De-duplication and FRBRization is extremely important in a consortium setting. De-duping merges multiple records in order to combine and display holdings in a single record as illustrated in figure 2.
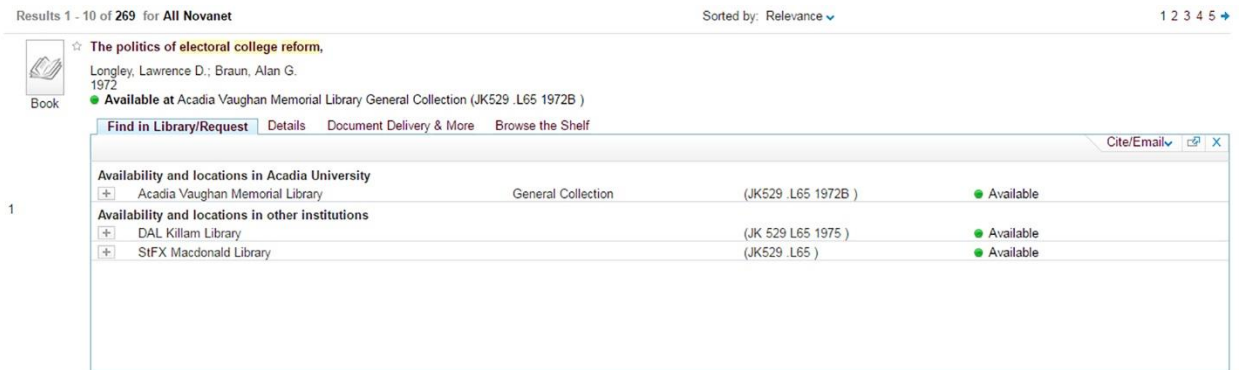

Figure 2. One merged record with holdings from three libraries.

Figure 3 shows a single entry for *Electoral College* by Lucius Wilmerding. Instead of separate records from each Novanet Library (see figure 3), Primo has FRBRized the records into one result.
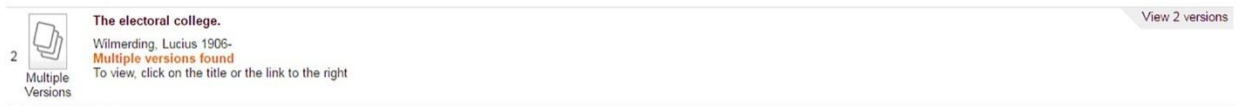

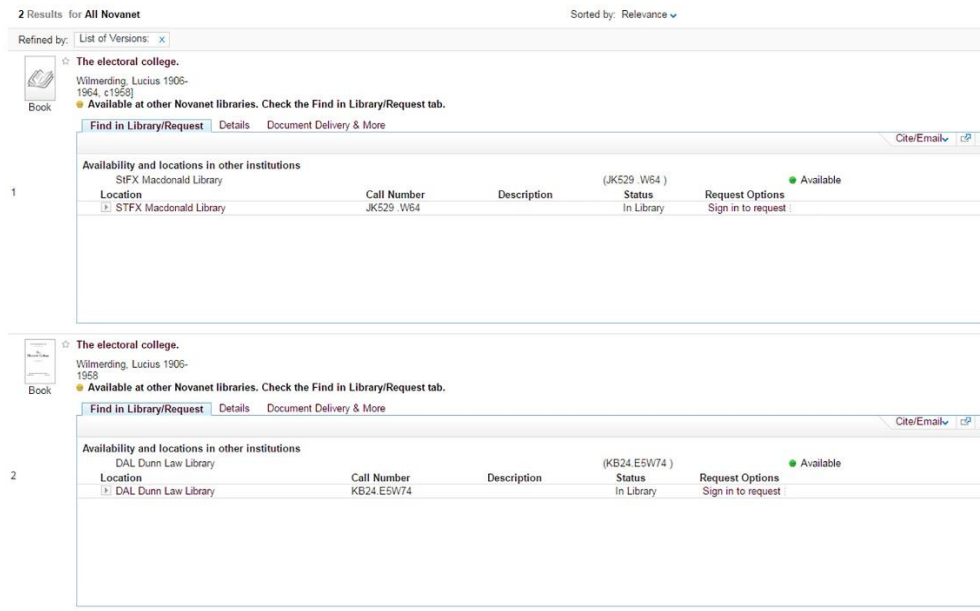Figure 3. FRBRized record display for *Electoral College*.

Figure 4. Display of the individual versions that were FRBRized.

The FRBRization process groups similar editions or varying format types of the same work together. In this example, two editions of *Electoral College* are grouped. After the user clicks on the title or the link to "View 2 versions," the user is presented with two possibilities as shown in figure 4. The first result is an edition published in 1964 and the second is the original work published in 1958 by Rutgers University Press. After extensive evaluation and testing, the steering committee and subcommittees recommended Primo to the Novanet Board of Directors.

Implementation and the politics of working in a consortium

The implementation phase for Primo at Novanet Libraries began in August 2014 with one representative interface and the expectation that a full public roll out would occur by the end of the calendar year. The same structure that was created for the selection and evaluation would be used for the implementation: an overall implementation steering committee with one member from each institution and smaller task-based ad hoc groups being struck as needed. The first task group created was related to link resolving due to the complexity of migrating different resolvers into one for ten libraries. This group assisted member institutions in the original setup of each library's instance of the SFX link resolver. SFX was licensed in conjunction with Primo and Novanet expected participating libraries to use it since SFX came with Primo. However, individual libraries were responsible for selecting targets in SFX for managing their own electronic holdings. Acadia had recently migrated from OCLC's link resolver to SFU's CUFTS

before Novanet adopted Primo. Thus, Acadia decided to continue to use CUFTS in addition to SFX. Acadia highly valued the CUFTS ERM included in the system for its public A-Z database and journal lists, and licensing modules. With no option for replacement of these services from Novanet, Acadia felt it was necessary to maintain two resolvers: CUFTS and SFX.

Site visits were scheduled halfway through the implementation to each institution and additional ad-hoc groups were formed to look at specific pieces: Fulfilment (DD and ILL), User Interface, Central Index, Marketing, Training/Instruction, and Course Reserves. These groups were advisory only. Outstanding issues continued following implementation: duplicate holdings for supposedly de-duplicated and FRBRized records, misleading labelling mainly in the area of available online access, and the ability to boost results for institution's holdings.

The steering committee made several recommendations regarding interface design with the aim of having the separate institutional views be as similar as possible. This would also streamline usability testing. While there was general agreement by all in principle, in practice this did not occur. One institution immediately customized the initial simple search to mimic the advanced search page and others made less drastic but still significant changes. Compounding the interface issue was the philosophical difference in opinion on how the discovery service should work. Many believed that users should cast a wide net and use facets to drill through their results. Others felt that the searching should start at what is available locally at their home institution and then expand if users did not find what they needed. Obviously this difference had a great impact on the configuration of Primo since many of the configuration options operated at the consortia level not with the home institution.

Four months' post launch, there were still significant outstanding issues, they included: title level hold irregularities, configuration of course reserves, incorporation of institutional repositories and LibGuides, generation of Primo and SFX reports, print holdings in SFX and modifications to the central indexing configuration. The official end of implementation for Primo finally came in June 2015, six months behind schedule. The catalyst for ending the implementation phase was the resolution of the two major issues for the consortium: title level holds and disappearing locations. It is interesting to note that the majority of such issues had nothing to do with Primo directly, but were actually Aleph configuration problems.[12]

Additionally, features that may be intriguing during selection and evaluation do not always turn out to be as impressive or useful in production. The ability to virtually "browse the

shelf" sounds great. However, the default cover art coming from Amazon and Google Books is underwhelming, see figure 5 for example. Better cover art service could have been implemented, but for an additional cost.
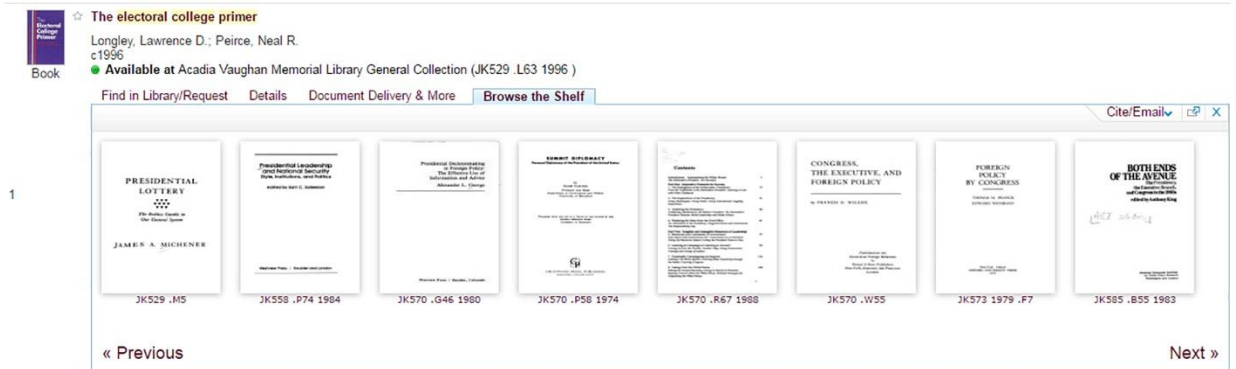

Figure 5. Browse the shelf feature.

Two other services have been added since June 2015. These include cited by and citations services (figure 6) and the BX recommender service (figure 7). Though these services are commonplace and work well in databases such as PubMed and Web of Science, they seem to be underused within Primo. Statistics for the BX recommender reveal that usage is less than one percent at Acadia. Statistics for the cited by and citations options are not available.

Figure 6. Citations and Cited by features.

Figure 7. Related Articles or BX recommender feature.

Troubleshooting and fail points within a consortia installation of Primo

Chasing a one size fits all solution creates a high number of potential fail points in a system, as noted by Novanet Manager Bill Slauenwhite in a recent telephone conversation.[13] Fail points within the consortia WSD environment can include:

- errors in the original cataloging records from the native interface (11 different cataloguing departments with varying local practices)
- metadata errors in resolver data

- errors in the Primo Central Index (PCI)

- metadata errors in the sources within the PCI

- incorrect selection of resources within the PCI

- search errors in the interface itself

- parsing issues between the vendor databases and the WSD

- interoperability with open access materials

- interoperability with institutional repositories.

The initial testing by librarians responsible for electronic resources and the WSD service found failure rates of 30 to 70 percent on resolving successfully to full-text journal articles based on a number of random subject or keyword searches. After reconfiguration of the PCI, including the removal of several broad coverage products from the index, the likelihood of success increased. Primo documentation notes that 90 percent of EBSCO content is accessible through sources within the index (even though Ex Libris does not have agreements for indexing with EBSCO), but due to the poor quality of metadata in some of the sources it was determined by Acadia that is was better to have fewer results successfully resolving to full-text content, than it was to cast a wide net with a higher number of errors.

Unfortunately, due to a number of delays, the consortium has not undertaken usability studies on the service yet. A brief review of search attempts indicate that patrons are looking for library resources or services that are not available in the WSD service, such as subject guides, tutorials and databases, and journals by title as noted by SFU resulting in the creation of their Library Search. Even with librarians teaching and directing patrons to the "journals" tab, patrons are still looking for journals within Primo. The librarians plan to review statistics and make the appropriate adjustments where possible to improve successful searches. Librarians and technical support staff at Acadia are considering the option of a bento box style overlay, similar to SFU's Library Search in the future.

Staffing and Workflow at Acadia with Primo

As observed in a 2013 survey for the ERM Report to the Council of Atlantic University Libraries, it appears that the management of electronic resources has been handled by the re-purposing of staff from technical services, circulation, serials, acquisitions, and systems.[14] Changes in current job descriptions and the incorporation of the management of electronic resources into new job descriptions has occurred, although overall staffing levels have not

increased at academic libraries in the region to meet the growing needs of electronic resource management.

As noted previously, each library within Novanet preserves autonomy, with most of the systems maintained and purchased separately, only the shared library catalogue, discovery layer, chat services and document delivery between the libraries are coordinated. Currently, one librarian and one staff member at Acadia are responsible for the management of electronic resources with some support from the library technology specialist and the web and user experience specialist. The time dedicated to electronic resources by the one librarian is only a portion of a full time position, as she is also responsible for liaison services to five departments, regular reference services, and the additional research and service work as a faculty member. One other librarian is responsible for Primo at Acadia as one of her many responsibilities.

Common themes

While the management of two knowledge bases is a shared experience between SFU and Acadia, there are some other common themes that appear, including staffing and workflow and the approach to maintenance and continual improvement, including troubleshooting.

At both SFU and Acadia, the responsibility of the management of electronic resources remains among few positions and no brand new positions have been created. However, at both libraries existing positions have been repurposed and re-defined, demonstrating the overall impact of the shift from print to electronic. In what department or unit those re-definitions occurred is different, which reflects the findings of Branscome, who investigated the management of electronic serials in academic libraries.[15] Survey results revealed a variety of approaches and strategies that reflected and addressed individual organizational needs.[16] Johnson also asserts that the management of electronic resources is an individual library decision: "No single model has emerged as the best way to manage the workflow and life cycle of e-content. Each Library must decide how to do this in the context of its current organizational structure, location of expertise, and number of available staff."[17]

Regular evaluation and re-evaluation of WSD will provide a more responsive and current service. Of course, initial assessment and evaluation is required prior to acquiring a WSD service[18], continual assessment and usability studies need to be applied to the complete online library environment and to ensure that the service is meeting the needs of users. This allows libraries to adjust search tools and their presentation, to better reflect the behavior of users and

their assumptions. For example, similar to SFU's and Acadia's experiences, other institutions have also found that users may enter location specific or administrative queries into their library's single search boxes, in addition to searches for known items such as database titles and research guides.[19] And, like SFU, some libraries have implemented bento box interfaces that offer a single search box query, but produce results from a variety of library systems, including WSD, website, catalog, institutional repository, electronic journal holdings, and more.[20]

A common error that needs constant attention, evaluation, and troubleshooting is failed link resolving:

> "The sharpest pain point is for end users of link resolvers and discovery tools, who may be incorrectly told their library has no access to the article they're searching for—or, perhaps worse, directed to a resource they believe should be available, only to be faced with a pay wall or error message."[21]

As in the case of SFU and Acadia, with more than one knowledge base in play, in conjunction with the indexing of the WSD service, identifying the cause of an error and fixing the problem can be very complex. The introduction of direct linking in WSD, negating the need for link resolving, has addressed some issues, but problems persist. Those who manage the service need to work through a checklist of possible issues, in an attempt to establish the root cause of the failed connection. Kornblau et al. suggest that "when choosing a discovery service, a library should consider which vendor's service allows for the most seamless access to its content."[22] However, in order to make the best possible match between collection and WSD service, selectors need to know what metadata the WSD index holds. Writing in 2012, Kornblau et al. stated that "today, there is less flux and more transparency regarding indexing and content inclusion in Web-scale discovery services; yet, there is still a great need for librarians to influence publishers and content providers to share their metadata with all discovery services and for discovery vendors to make the content in their products even more transparent and interoperable."[23] Similarly, in a NISO Discovery to Delivery white paper, Breeding points out that WSD services have put processes in place to manage situations in which metadata is not available: "Libraries have to examine the coverage of a discovery service quite carefully to understand when a discipline-specific A&I database is included directly or whether it is covered indirectly through full-text or citation indexing."[24] Lastly, the trend of vendors offering the full suite of electronic resource management products (WSD, knowledge base, link resolver and

ERM) is arguably becoming standard: "Some libraries have already migrated away from link resolvers and knowledge bases previously in place to achieve better alignment with newly acquired discovery services...The differences among the link resolvers are increasingly trumped by broader integration concerns."[25]

Conclusion

In September 2016, SFU Library announced that Alma with Primo from Ex Libris was the successful vendor following a detailed procurement process for a new Integrated Library System to replace Millennium from Innovative Interfaces, Inc., which has been in use at the library for over twenty years. SFU Library expects to go live with Alma and Primo in May 2017. The library's experience of implementing and managing Summon for six years highlighted the growing challenges of managing electronic resources. Managing multiple knowledge bases is unsustainable for a large library such as SFU. Responsibilities and tasks related to managing electronic resources should be delegated and distributed amongst all staff in technical services.

However, without Summon, Library Search may not have been developed or offered and would not be nearly as successful without the power of the Summon API. SFU Library has high hopes that Library Search can continue in an ALMA and Primo environment and looks forward to more unified electronic resource management. Indeed, with the adoption of ALMA and Primo, the SFU Library has made the decision to decommission CUFTS and its associated services effective May 2017.

At Acadia and within the Novanet Consortium financial constraints will delay the adoption of a full Library Services Platform (such as ALMA) for an unknown period of time. Novanet has recently struck an ERMS Working Group to investigate potential solutions to managing electronic resource administrative and licensing data. Acadia will be moving to using only SFX as its link resolver in 2017.

The landscape of electronic resource management will continue to change along with the behavior of users and their expectations, as well as with advancements in the technologies that create and support WSD. Libraries will change and adjust workflows and those who manage the resources will need to continually strengthen their ability to be flexible and communicative.

Notes

¹ Helen Georgas, "Google vs. the Library (Part II): Student Search Patterns and Behaviors when using Google and a Federated Search Tool." *Portal: Libraries and the Academy* 14, no. 4 (2014): 503-532, doi:10.1353/pla.2014.0034; Tamar Sadeh, "From Search to Discovery." *Bibliothek Forschung und Praxis* 39, no. 2 (2015): 212-224; Beth Thomsett-Scott, and Patricia E. Reese, "Academic Libraries and Discovery Tools: A Survey of the Literature." *College & Undergraduate Libraries* 19, no. 2-4 (2012): 123-143, doi:10.1080/10691316.2012.697009.

² Beth A. Branscome, "Management of Electronic Serials in Academic Libraries: The Results of an Online Survey." *Serials Review* 39, no. 4 (2013): 216-226, doi: 10.1080/00987913.2013.10766402; Amy I. Kornblau, Jane Strudwick, and William Miller. "How Web-Scale Discovery Changes the Conversation: The Questions Librarians Should Ask Themselves." *College & Undergraduate Libraries* 19, no. 2-4 (2012): 144-162, doi: 10.1080/10691316.2012.693443; Mary M. Somerville, "Digital Age Discoverability: A Collaborative Organizational Approach." *Serials Review* 39, no. 4 (12, 2013): 234-239, doi: 10.1080/00987913.2013.10766404.

³ Somerville, "Digital Age Discoverability," 234-239.

⁴ Ibid.

⁵ Roberta F. Woods, "From Federated Search to the Universal Search Solution," *Serials Librarian* 58, no. 1-4 (2010): 141, doi: 10.1080/03615261003622957

⁶ Thomsett-Scott and Reese, "Academic Libraries and Discovery Tools," 127.

⁷ Sadeh, "From Search to Discovery."

⁸ Georgas, "Google vs. the Library (Part II)," 521.

⁹ Ibid., 522.

¹⁰ Leanna Jantzi, Jennifer Richard, and Sandra Wong, "Managing Discovery and Linking Services," *The Serials Librarian* 70, no. 1-4 (2016): 184-197, doi: 10.1080/0361526X.2016.1153331

¹¹ NASIG, "Core Competencies for Electronic Resource Librarians," approved by the NASIG Executive Board, July 22, 2013, revised by CEC, January 26, 2016, 2016. http://www.nasig.org/site_page.cfm?pk_association_webpage_menu= 310&pk_association_webpage=7802

[12] Bill Slauenwhite (Novanet Manager), e-mail to the author, October 7, 2016.

[13] Bill Slauenwhite (Novanet Manager), in discussion with the author, October 2016.

[14] Jennifer Richard, "Report on the CAUL-CBUA Electronic Resource Management Study" (Halifax: Council of the Atlantic University Libraries, 2014), http://caul-cbua.ca/sites/default/files/Grant%20Report%202012%20-%20J.%20Richard.pdf

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