Smart Libraries Newsletter

News and Analysis in Library Technology Developments

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Smarter Libraries through Technology

The Critical Need for Efficient Resource Sharing

By Marshall Breeding

It's an unfortunate reality that no library today has the funding to acquire all the resources needed to satisfy the research needs and interests of its users. Even the most well-funded libraries must make difficult choices regarding the print and electronic resources they are able to acquire. The limitation of library budgets and the constant increases in pricing result in incredible pressure on the development of collections.

Libraries naturally supplement their direct collections with additional services where they can obtain materials from external sources when needed by their patrons, such as interlibrary loan, document delivery, and other resource sharing services. When not available locally, libraries aim to provide requested materials in the fastest, most efficient, and least costly way possible.

The genre of resource sharing products and services has had an interesting history. OCLC's Interlibrary loan service, currently branded as WorldShare ILL, has been the mainstay of this arena but is perceived as a powerful but costly option. OCLC has consolidated its position in the resource sharing arena through its 2017 acquisition of Relais International and through the development of Tipasa as a migration path for the almost ubiquitous ILLiad software for managing ILL operations. SHAREit from Auto-Graphics is likewise a longstanding and successful interlibrary loan system, mostly oriented to public libraries and is the basis for many statewide initiatives. INN-Reach from Innovative Interfaces was initially developed as a resource sharing brokering system for consortia where each member uses its Millennium ILS, but it has since been enhanced to support other ILS products. Ex Libris has become a major player in the resource sharing arena through consortial implementations of its Alma library services platform with built-in capabilities. FulfILLment, an open source interlibrary loan software, developed by Equinox, languished for many years but has recently been implemented by the Connecticut State Library for its interlibrary loan service. Other products have come and gone. The URSA interlibrary loan service developed in Australia in the 1970's became established as the leading resource sharing system but saw its demise in 2011 when it was discontinued by SirsiDynix.

Dramatic events can spark the need for urgent resource sharing arrangements. Catastrophic events such as a flood, as seen at Colorado State University, or large-scale cancellations of journal subscriptions can trigger exceptional responses in the library community. It is important for there to be scalable and affordable services to bridge the volatile gap between the materials that libraries own or license and those needed by their constituents. Libraries are increasingly interested in providing transparent services that fulfill materials needed by their users regardless of whether it is directly owned or acquired through an external partner or service.

This issue of *Smart Libraries Newsletter* features a new set of events in the resource sharing arena. Ex Libris has acquired the popular RapidILL service from Colorado State University (CSU) and is developing a new resource sharing application based on its Alma library services platform. These two moves represent an ambitious new strategy to yet again expand its reach into academic libraries.

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Ex Libris Acquires RapidILL

In a move that expands its exiting involvement in resource sharing for academic libraries, Ex Libris has acquired RapidILL from Colorado State University. This acquisition expands the company's existing strategy to develop resource sharing products based on its Alma library services platform. RapidILL will continue as a service available to all libraries regardless of the automation systems used. Ex Libris and Colorado State University position this acquisition as an opportunity for RapidILL to see faster software development and to expand its presence globally.

Overview of the RapidILL Service

The RapidILL service supports expedited interlibrary lending of journal articles and other materials among peer institutions. Institutions subscribing to RapidILL pay an annual subscription fee and make commitments to fulfill requests made to them within a specified number of hours. Participation in RapidILL enables libraries to provide a service to their users where articles not within their direct collections can be provided the same or next business day. In addition to the subscription fees, these libraries must also dedicate sufficient staff resources in their own Interlibrary Loan offices to fulfill their service commitment to provide materials to their peer institutions. The RapidILL business model does not include transaction-based costs. Since the load leveling algorithm distributes the workload evenly, costs are managed entirely through annual subscription fees.

The current RapidILL system is based on the basic concepts established from the earliest phase of the project. The routing of requests is based on a database of holdings, so that the systems knows that the item is owned by the library and likely to be on the shelf before the request is sent. This approach avoids the need to take additional time to verify citations. Libraries participating in RapidILL are assigned to "pods" defining the peer groups for requests and fulfillment. Pod membership informs the routing algorithm. Requests can be funneled into Rapid directly or through workflow management applications such as Relais, ILLiad, or Tipasa.

A database of ejournal titles and articles and holdings data powers the service. This database, harvested from the systems of the participating institutions, currently includes over 35 million article records with detailed data regarding which libraries own each title. This data supports a highly efficient routing and request process that transmits a request to a library only when the database indicates it should be available. This routing algorithm eliminates the need to verify requests or to waste time looking for items not held by the lending institution. Load balancing is built into the routing to evenly distribute requests among libraries. The organization of participating libraries into pods and the load balancing ensures that no single library receives a disproportionate level of requests, even if it has deeper collections.

To fill a request for a print article, the lending library pulls the journal, scans the article, and uploads it into RapidILL system. Articles from electronic subscriptions can be directly uploaded if allowed by the terms of the owing library's license agreement. If license agreement terms do not allow electronic lending, the item will be fulfilled from a print copy.

The RapidILL software provides extensive reports and analytics regarding the performance of the service. These reports validate that each library has met its service commitments and documents the overall number of requests made and fulfilled by each library, across pods, and for the entire system.

In 2018 RapidILL processed 1.4 million transactions, with a 95 percent fulfillment rate. Requests for journal articles were fulfilled on average in 11.2 hours.

At the time of the acquisition, about 320 libraries were participating in RapidILL. Most participating institutions are in the United States or Canada, though the service also includes some libraries in Asia, Australia, and New Zealand. RapidILL was initially designed for articles and has since expanded to other materials. The service now includes book chapters, with 193 libraries involved in this service. The more recently established RapidR for returnable items is used by 77 libraries.

RapidILL Project History

The Morgan Library of Colorado State University developed RapidILL as an expedited article delivery service in response to the almost complete loss of its print journal collection in a flood. In July 1997, Fort Collins, Colorado, including the CSU campus, experienced a massive flash flood. The print journal collection and other materials in the lower floor of the Morgan Library were damaged beyond repair, leaving the library in need to take extraordinary measures to meet the research needs of the university. At the time of this event, scholarly articles were accessed primarily through print journals; the transition to e-journals was in its infancy.

In response to the loss of the journal collection just prior to the beginning of the academic year, the interlibrary loan department of the CSU libraries began a service for expedited provision of articles to its patrons. The library identified four peer institutions—University of Arizona, Arizona State University, Washington State University, and University of Massachusetts Amherst—with similar collection profiles that were interested in helping with their collection recovery project. Colorado State University purchased computing equipment and provided funding for additional staff in each of these libraries dedicated to responding to article requests. Software was developed for this project that created a database based on extracts from the catalogs of the partner institutions, enabling requests to be directed to the libraries known to have the item. The database was comprised of detailed holdings data, including journal titles, shelving location, call numbers, and years of coverage.

The success of this project in fulfilling the needs of the CSU libraries sparked interest among the partner libraries to expand the service into a two-way interlibrary loan system. The original partner group was expanded to include the University of Michigan to create the collection diversity anticipated for high fulfillment rates. This group of libraries formed the initial pod for the Rapid (Rapid Access, Processing and Information Delivery) service launched in 2001.

Since that date, the Rapid service has continually expanded to include additional institutions, the formation of new pods, and extensive software development. In 2004 a major software development project was completed to enhance functionality and to reengineer its architecture to enable the system to support a greatly expanded community of participating libraries. The new technology platform was put into production in early 2005 and is the basis of the RapidILL service in use today. Enhancements were made to the service to support the request and fulfillment of book chapters (2013) and later for books and other returnable materials through a pilot started 2014.

Acquisition Details

During the initial period following the acquisition, Ex Libris plans to continue to operate the service in its current form. As part of a global company, ongoing development will be accelerated, and the service will be marketed to libraries outside North America.

Following the acquisition of RapidILL, the operation of the service and the personnel involved have become part of Ex Libris. Out of the five individuals at Colorado State University involved with the service, four have become Ex Libris employees and will continue to work from Fort Collins. The company acquired the software behind the RapidILL service and related intellectual property, which was transferred from Colorado State University.

Within Ex Libris, the RapidILL project will report through Sharona Sagi, Vice President for Resource Sharing Solutions. Mike Richins, who was the Coordinator of Rapid Technology Support and System Development for Rapid at Colorado State University, joined Ex Libris as Director of Product Management for RapidILL.

Within Colorado State University, RapidILL fell under the responsibility of Pat Burns, Vice President for Information Technology and Dean of Libraries. Burns initially joined the university in 1978 as a Professor of Mechanical Engineering and became director of Advanced Computing and Networking Services in 1998. In 2008, his portfolio expanded to include Dean of Libraries. Burns retired from the university in May 2019.

Under Ex Libris, RapidILL will continue as a service that can be used by libraries and consortia regardless of the resource management systems, discovery services, or ILL brokering systems used. Libraries using Alma and Primo will benefit from the enhanced integration that Ex Libris will implement within its own product suite.

The financial details of the acquisition were not publicly disclosed. This transaction involves the transfer of the RapidILL and related intellectual property, selected personnel involved in the service, and the service contracts and related revenue from current participating institutions.

The transfer of a project from a public non-profit university to a commercial company is not unusual. Most universities operate a technology transfer or business development unit to facilitate these arrangements. Within the library technology industry, previous examples include the commercialization of the VTLS software out of Virginia Tech University and the acquisition of the SFX context-sensitive linking application from Ghent University.

Anticipated Expansion under Ex Libris

Under Ex Libris, the development of RapidILL will continue according to the roadmap established by Colorado State University, accelerated through the deeper resources available. The development agenda and user expansion will be more scalable under Ex Libris than was possible previously at Colorado State University.

Prior to the acquisition by Ex Libris, the RapidILL group at Colorado State University had already developed integrations and efficiencies for Alma. Colorado State University selected Alma in 2016 to replace the Millennium ILS in place for two decades. About half of the RapidILL participants have implemented Alma, so it was previously established as one of the major systems for which integrations were established.

Alma libraries can configure a profile to publish their holdings for RapidILL using OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting).

While RapidILL has seen a constant influx of new participants, it has the potential to see significant expansion under Ex Libris. The company's global sales force will be able to market the service in all global regions.

Ex Libris Resource Sharing Strategy

Over 1,500 libraries have selected Alma as the library services platform supporting the management of its print and electronic resources. Many of these libraries continue to rely on other bibliographic service as sources for cataloging records and participate in multiple resource sharing services or partnerships. As the resources in the Alma Community Zone reach a critical mass, possibilities emerge for diminished reliance on external services and their associated costs. Much overlap exists, for example, between libraries using Alma and those using OCLC's WorldShare ILL and Cataloging services. This scenario presents an opportunity for Ex Libris to expand its reach into the realm of resource sharing, both through new product development and business acquisitions.

This acquisition can also be seen within the context of the emerging Ex Libris strategy to develop resource sharing products and services. At the recent ELUNA (Ex Libris Users in North America) meeting, the company discussed its strategy and demonstrated early prototypes for a new resource sharing capability delivered through Alma through a new interlibrary loan and document delivery brokering application, including patron request and fulfillment management. While Alma has native resource sharing functionality among members of a consortium, this new capability would have a broader reach. The resource sharing service includes functionality in a patron-facing interface, which can be integrated into Primo, for placing requests for items not held in the user's local library or consortium. The interface presents options to the patron, including delivery methods, estimated time to fulfill, and anticipated loan periods for returnable items.

The system would then have routing and fulfillment components that enable the request to be satisfied by other Alma libraries participating in the service. Ex Libris intends for this product to provide workflows for both returnable and non-returnable items. Ex Libris estimates that based on the current resources within its Alma customer base, it would have the ability to fulfill 80 percent of requests.

Now within the Ex Libris fold, the company plans to strengthen the direct integration of RapidILL service within Alma's existing resource sharing features. This integration would be accomplished without compromising its ability to integrate with other integrated library systems or library services platforms. Ex Libris will also benefit from the expertise of the RapidILL team as it develops other aspects of its resource sharing strategy. This team has well demonstrated its capabilities to develop a vision for efficient and effective interlibrary loan services.

In 2018, Colorado State University began the development of a new system to support the lending of returnable materials—Project Bedrock. The system manages workflows for lending and borrowing and has similar functionality to products such as ILLiad, Relais D2D, and Tipasa. Initial development is completed, but not yet to the stage for beta testing or production implementation. Rather than advancing this project, Ex Libris will continue its existing development effort to create an interlibrary loan management service based on Alma, including many of its features and concepts.

The development of a new resource sharing service fits within Ex Libris' broader strategy of creating multiple services supported by its Higher Education Cloud Platform. Alma provides the foundation of this platform, enabling the development of other products, such as Leganto, Esploro, and Rialto, and taking advantage of common functional and content components. Resource sharing would be one of the next offerings of the Higher Education Cloud Platform. Ex Libris continues to incrementally extend its reach into additional activities within the sphere of academic libraries and broader higher educational institutions, leveraging its expertise of this domain and its previous investments in product development.

RapidILL Timeline

- July 28, 1997: Spring Creek flood in Fort Collins, CO. The lower floor of the Morgan Library of Colorado State University is flooded, destroying much of its print serials collection.
- 1997-2001: Service established in four peer libraries to deliver articles to Colorado State University with next-day fulfillment.
- 2001: System expanded to two-way borrowing and requesting service called Rapid.
- Colorado State University funds $750,000 project to redevelop and enhance Rapid software for additional functionality and scalability to support expanded participation.
- 2005: Current RapidILL service launched.
- 2013: Rapid expands service to include book chapters.
- 2014: Rapid launches pilot for lending returnable items (RapidR).
- 2018: Development begins for Project Bedrock to manage

ILL lending and borrowing workflows.
- June 20, 2019: Acquisition of RapidILL by Ex Libris from Colorado State University announced.

Related Resources

RapidILL: http://rapidill.org/

Breeding, Marshall. "Resource Sharing in Libraries: Concepts, Products, Technologies, and Trends." *Library Technology Reports* 49, no. 1 (January 2013). This issue describes the products and services for resource sharing. The status of some of the products has changed since the date of this report.

Delaney, T. and Richins, M. "RapidILL: An Enhanced, Low Cost and Low Impact Solution to Interlending." *Interlending & Document Supply* 40, no. 1 (2012): 12-18.

MacWater, Cristi. "Having It All: Using RapidILL for Book Chapter Interlending." *Interlending & Document Supply* 41, no. 3 (2013): 87–89.

Smart Libraries Q&A

Each issue Marshall Breeding responds to questions submitted by readers. Have a question that you want answered? Email it to Samantha Imburgia, Managing Editor for ALA TechSource, at simburgia@ala.org.

What best practices do you recommend for our library websites?

In my work to maintain the libraries.org directory of libraries, I regularly visit the websites of dozens of libraries every day. This work gives me a good vantage point on the state of library websites, which range from world-class design with sophisticated features to those with minimal capabilities. Many libraries have no website at all. Of the 17,312 public libraries in the United States recorded in the database, 1,087 have been confirmed recently as having no working website.

The library websites I have observed range from superlative quality to those with glaring problems. These sites inform these suggestions for what to do and what not to do in the implementation of a library website. These recommendations deal more with the technologies involved than design and layout.

Library websites must use the https protocol to encrypt the delivery of their content to meet basic expectations for privacy and security. Implementing https will cause web browsers to show a padlock or other indicator that that the page is properly encrypted and safely viewed. Sites that instead use the http protocol send content as clear text, vulnerable to network eavesdropping. Unencrypted websites are not consistent with the expectations for libraries to protect the privacy of the individuals using their information resources. Using non-encrypted http has other highly negative implications. Web browsers, since October 2018, flag sites using http as insecure and untrustworthy, a status that no library would want associated with their website. Libraries aim to provide vetted and objective content, and it would be unfortunate for their sites to be branded as unreliable due to a lapse in the technical configuration of their server. For an in-depth discussion of this issue, see the forthcoming October 2019 issue of *Library Technology Reports*.

Almost all libraries use Google Analytics to measure and assess the use of their websites. The use of this free tool is controversial relative to privacy concerns. Google Analytics works through the placement of a tracking code embedded on each page, which sends data Google's servers each time an item is accessed. Libraries should verify that transmitting raw usage data to a commercial organization is consistent with their privacy policies. The service can be configured to anonymize this data by truncating the IP address. To be consistent with library values and privacy policies, this anonymization configuration option should be activated (see: https://support.google.com/analytics/answer/2763052).

Given the now dominant proportions of web access though mobile phones, library websites must be designed to work well on these devices. The implementation of a responsive website ensures that each page is delivered according to screen size and capabilities of each type of device. To accommodate smartphones, the layout of pages must be fluid, have scalable fonts, and not have touchpoints so close that navigation is difficult. If users on a smartphone need to pinch the screen to manually expand portions of the screen to read the text or enter a search, then it is not responsive and will be avoided by those trying to use it from their phones. Most content management systems now include responsive themes that can jumpstart your design toward the goal of working well with all devices. You can also use freely available frameworks such as React (initially developed by Facebook), Angular JS

(Google), and Bootstrap (Twitter) to build pages with modern interface features and responsive layout. Also be sure that the measures you take to work with smaller devices don't frustrate those accessing your site with full-sized laptop or desktop computers. I have come across some library websites that require constant scrolling and that don't offer menus or other navigation shortcuts.

Sites that do not support mobile access are also punished in search engine rankings. Google initially incorporated mobile factors into its search engine rankings in 2015, which were expanded in 2017. The company provides guidelines on mobile support (https://developers.google.com/search/mobile-sites/). Site managers can check whether Google considers a page mobile friendly: https://search.google.com/test/mobile-friendly.

Libraries should also be sure that they are designing their websites in ways that meet requirements for use by persons with disabilities. This topic was addressed in the Q&A section of the August 2018 *Smart Libraries Newsletter*. In most cases, a clean layout and a responsive design will also go a long way toward compliance with the characteristics needed for compliance with disability-related requirements such as Section 508 and Web Content Accessibility Guidelines. Valid implementation of HTML5, which includes mandatory alt text for images, will also help meet compliance.

Libraries should also be careful regarding the placement of social media links, badges, or widgets on their websites. There are multiple areas of concern. One involves the attention and engagement. Placing an outbound link on the library's website to its social media pages jettisons users that have visited the library's primary destination on the web for providing access to its information resources and services to an external commercial site. While increasing the numbers of visits to a library's social media pages might be one measure of its user engagement efforts, it should not come at the expense of its own website. Widgets to share or link to a social media account may also include coding that tracks the user's activity on the library's website. At a minimum, these widgets make data available to the social network that the individual has visited the library's site. In some cases, query strings or other information may be held in third party cookies that may leak more sensitive data. Maintaining a presence on Facebook and other social networks can benefit the library. For its constituents that use these networks, they can provide details such as the library's location, hours, and contacts, as well as feature photos, videos, and other media to feature events and programs. Social media pages should be designed to build interest for the library and funnel individuals to its physical or virtual presence.

I have come across some libraries that rely entirely on a Facebook page rather than have its own website. Such a reliance on a commercial social networking site seems less than ideal for representing the library on the web, though it may be perceived as a convenient way to have some type of presence for those that lack the resources and expertise to deploy their own websites.

To be consistent with protecting the privacy of individuals that visit library websites, great care should be taken to avoid accidently or intentionally imbedding tracking agents for advertising networks. The advertising ecosystem aggressively collects personal information in order to be able to deliver highly targeted ad placements. The tracking agents may be associated with desired features, such as the Google Custom Search Engine, analytics, performance monitoring, or other services. Some library websites may contain tracking agents unintentionally through JavaScript coding borrowed from other sites. Website managers can use browser extensions such as Ghostery to identify tracking agents.

It is important for library websites to use validated coding. Even though a page may appear on your browser as expected, technical errors on the page may cause it to not display correctly on other browsers or on other types of devices. Site managers should check every page for HTML and CSS coding, using one of the free validation tools, such as the W3C Markup Validation Service (https://validator.w3.org/).

The URL that represents the library website should be considered a strategic branding element. It should reflect the identity of the library and once established should not be changed except under extraordinary circumstances. As noted earlier, the website must be configured so that the protocol component is https:// and not http://. Using a secure protocol gives confidence that the site is trustworthy and confirms that its domain has been vetted to belong to the expected organization.

Libraries should create their URL within the appropriate top-level domain. Only libraries serving commercial organizations should operate within the .com domain. Currently 1,994 public libraries in the United States have URLs within the .com domain, a glaring inconsistency with their non-profit and educational status. Academic libraries will usually fall within the .edu domain of their parent organization. Public libraries then use .org if associated with non-profit organizations, or an appropriate geographic (tn.us) or a governmental domain (.gov).

I observe that many library websites use URLs within the .com domain related to a service provider or hosting service. Over 200 libraries rely on a content management service from The Library Corporation, which carries the "youseemore

.com" URL (such as: https://www.youseemore.com/mecklib/). Another group of libraries have URLs related to the LibGuides content management platform from Springhare (such as https://edgecombelibrary.libguides.com). Many libraries lacking budgets for building a website use free services such as wix .com or Google Sites. The use of a commercial hosting service or content management system does not necessarily require the library's site operate through its domain or URL. Instead, the library can make a DNS configuration, creating a CNAME entry that creates an alias, which enables the site to operate under its own domain instead of the one associated with its provider.

The other elements of the URL should be as simple and clear as possible. Some conventions have become well-established among libraries. For academic libraries, the URL may depend on whether or not the library website operates within the university site (such as https://myuniversity.edu/library) or is deployed independently (https://library.myuniversity.edu). Public libraries may be part of a city or county website (https://mycounty.state.us/library) or may have their own site (https://mypubliclibrary.org). Note that the convention of using "www" as part of the URL is less common in recent years. Libraries should also avoid including file names or other elements that will cause the URL to break should you need to change the underlying content management system. Rather, use the default page naming of your web server (https://mylibrary.org instead of https://mylibrary.org/index.html). The use of file names for the main site or key landing pages will result in unstable URLs that will break each time your library changes its hosting environment. Also avoid the domain elements associated with specific content management products (such as https://libguides.mylibrary.org). The URL for your library website should be considered as a constant brand that must live beyond any specific product or hosting arrangement.

Incorporating structured data into the library website will improve its discoverability through Google and other search engines. Structured data, following established vocabularies such as schema.org as well as standard descriptors in page headings are not visible to human visitors to your website, but enable search engine harvesting crawlers and other computer-based agents to more easily parse the content of the site. Many key elements of a library website can be expressed through schema.org, such as its organizational entity, physical address, geographic coordinates, phone number, operating hours, and event schedules. The inclusion of structured data brings the library into the realm of the semantic web, enabling interoperability with other information services in parallel with conveying information to individuals visiting the site.

Libraries should be careful in the use of multimedia content on the site. I have come across some library websites that automatically play music when launched. This is a feature that will not be appreciated. Likewise, there are few circumstances where an auto-play video might be warranted. Be judicious with rich media, finding a balance between using it to provide dynamic and enriching content but not surprising your visitors with unexpected audio or video.

It is essential for every page on the library website to load quickly. I've encountered many library websites that were difficult to use due to the slowness of each page. Website managers should naturally monitor website performance and identify any components or dependencies that may be introducing latency. The "network" tab of the Developer's Tools built into the Google Chrome browser details the performance of every component within a page.

It is very helpful to the visitors of the website to offer an e-mail address for contacting the library. Providing a built-in form to send messages is not user-friendly. While publishing an email address may lead to some unwanted messages, you are more likely to hear from your community members about questions or issues they want to ask. If you must use a form, be sure that it works. On many occasions I have composed a message on a library website only to receive an error when submitted.

Also within the realm of privacy, libraries should avoid including coding that requests the visitor's location. Almost all browsers will intercept requests for location data and present an alert where the visitor must accept or reject the request. Current Javascript frameworks allow a Geolocation.getCurrentPosition() request, which may be considered intrusive relative to the privacy of users.

Be sure to provide a "Favicon" as part of the library URL branding. This icon, though limited to a finite number of pixels, can be a simplified version of the library's logo or some other visual association with the library that will appear on browser tabs or other contexts.

These suggestions cover some of the basic technology concerns that should be addressed in the deployment of a library website. Most can be implemented easily and can be accomplished though incremental changes in the configuration of the web server. Others may involve more complex changes and may need to be incorporated into the library's next website redesign project. Libraries can't be complacent with their websites. They demand constant attention in many areas, including design and functionality in addition to the technical issues mentioned above.

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