# Smarter Libraries through Technology

## Balancing Print and Digital

By Marshall Breeding

It's a basic observation that libraries today remain committed to providing access and services to collections spanning all possible formats. While libraries generally see increasing proportions of digital content, print has not vanished from the scene as many predicted a couple of decades ago. Libraries therefore must manage complex collections spanning physical and digital formats.

The reality of hybrid libraries brings important implications for the technology infrastructure required to support managing and providing access to collections. The requirements for library systems continues to become increasingly complex. Acquiring and lending a physical item involves considerably different technology than providing access to digital content. The procurement and business processes span so many options, ranging from one-time purchase of print materials to licensing of digital content, with almost endless combinations for terms, restrictions, and price models. The core automation systems used by libraries must be able to address all these possibilities.

Adding further complications, the basic patterns of collections and services between academic and public libraries have become strikingly different. Academic library collections are heavily dominated by licensed content of scholarly content with a shrinking proportion of print acquisitions. These electronic resources are acquired through a complex array of content packages, aggregated databases, and other offerings. The transition to open access in scholarly publishing adds yet another layer of complication as article payment charges and other arrangements become a growing part of the financial environment. Public libraries see quite a different set of patterns. Print collections continue as their foundation, with most public libraries seeing strong activity in their circulation transactions. Public libraries are also heavily involved in digital lending of e-books, audio books, streaming video, and other content. Currently digital lending represents a fairly small portion of overall transactions compared to print circulation, though increases are expected in the long term.

The divergence of the nature of their collections and services has driven public and academic libraries along increasingly separate paths for their technology infrastructure. In very broad terms, academic and research libraries are moving to library services platforms, such as Ex Libris Alma and OCLC WorldShare Management Services, while public libraries mostly remain with integrated library systems (ILSs).

The technical environment for the support of digital lending for public libraries differs substantially from the way that academic libraries manage their electronic resources. Rather than shifting to a comprehensive resource management environment, public libraries mostly rely on separate tools or platforms for the management and access to their collections of e-books and audiobooks. The most common arrangement includes engaging with commercial digital lending providers such as Overdrive and bibliotheca for the acquisition and delivery of digital content and a standard suite of integration technologies to provide discovery and lending of those resources through the library's online catalog or discovery interface.

As public library e-book lending continues to gain a higher profile, the technology options have steadily improved. Each of the commercial providers have made significant improvements to their patron-facing apps and interfaces. Overdrive's new Libby app and bibliotheca's convergence of digital lending and self-service are representative of these positive developments. Despite these improvements, public libraries are also exploring new alternatives for managing digital lending. In addition to the commercial offerings, a new non-profit initiative based on open source software components has completed its pilot phase and has been introduced as an option for public libraries in the United States. This issue of *Smart Libraries Newsletter* takes a closer look at this new collaborative launched by the Digital Public Library of America (DPLA), New York Public Library (NYPL), and LYRASIS.

# An Open Source Option for Public Library E-book Lending

A collaboration between DPLA, NYPL, and LYRASIS is working to develop a new alternative for public library e-book lending.[1] This infrastructure includes an open source repository, a mobile e-book reader, and a marketplace for libraries to purchase titles for lending. In the context where e-book lending for public libraries is dominated by commercial platforms, this new alternative represents a community-based alternative that is based on open source software and a non-profit business model.

## E-book Lending Technology Basics

Library e-book lending services require specialized support, including several components of technical infrastructure and business processes. These components comprise an ecosystem enabling libraries to acquire licenses to lend books from publishers, to gain access to controlled digital copies of each title, functionality to manage lending transaction to patrons, and an interface or apps used by patrons to search, access, and read materials provided for them by the library. Characterized generally as digital lending, these services can include e-books, audiobooks, streaming or downloaded video, or other types of content.

Providing access to free materials, such as those with expired copyrights or published under an open access arrangement, does not require such a complex environment. Much of the material of interest to public library patrons, however, remains within copyright, and publishers require specific control mechanisms to ensure that unrestricted copies of their digital assets not be released on the internet. Publishers use digital rights management on their own platforms or for their e-commerce distributors and likewise require similar protections in systems enabling library lending.

The business component of a library digital lending environment is comprised of a catalog of titles that are available to libraries. This catalog would be accessed by the librarians responsible for purchasing content titles for the library. It would include titles for which the provider has negotiated licenses from publishers and may also include free materials available in the public domain or other non-restricted arrangements. The provider's digital lending service would typically work with a wide range of publishers to negotiate licensing arrangements that specify the cost and lending rules applicable to each title. The catalog would usually include features that enable a library to select titles to add to their collection and to manage account and financial details.

Another component of a library e-book lending environment manages the borrowing and delivery of the titles the library has acquired for its patrons. This circulation management system includes capabilities to enforce the restrictions required by the publisher and the lending policies of the library. E-book circulation rules might include restrictions to the number of simultaneous active loans allowed at a time, the number of accumulated loans allowed per copy of a title as well as library-set policies, such as the number of days allowed for a borrowed item, whether renewals are possible, and the number of loans a patron can have at a time. This circulation control module would also manage the access of the digital copy of the item for the patron, including any technical interactions with the user's app or device needed for the digital rights management technology.

Library patrons need some type of app or interface to take advantage of its digital lending offerings. The most common method of access involves an app that the library or the provider makes available for installation on the patron's e-book reader, smartphone, tablet, or computer. Web-based apps or interfaces may also be provided for use on laptop or desktop computers.

Current library digital lending environments also include interoperability mechanisms between the library's online catalog and the digital lending platform. This interoperability

enables patrons to use the library's online catalog and see results of both physical items in the library and digital versions. It also allows patrons to select and download titles for reading. In support of discovery of digital content in the library's online catalog, MARC records may be loaded into the ILS for indexing, usually through an automated batch process. A set of APIs mutually activated between the external digital lending platform and the library's ILS can streamline and simplify the patron's experience. These APIs enable check-out and download of available material or placement in a hold queue for titles not immediately available due to check-out thresholds. Patron borrowing of digital materials can usually be done without an additional logon beyond the library's online catalog. The patron account feature in the online catalog would then show both print and digital items current checked out. The integration of e-book lending services has advanced considerably since the early days of these services where the e-book lending link would simply transfer patron to the provider's platform.

## The Commercial Environment

A fully commercial paradigm for library e-book lending has become well established. In the United States, for example, most public libraries offer at least some digital lending through commercial providers such as Overdrive, bibliotheca cloudLibrary, Axis 360 from Baker & Taylor, or RB Digital from Recorded Books. These vendors offer large catalogs of titles available for libraries to license for lending to their patrons through terms negotiated with publishers. Each offers a marketplace for libraries to select and pay for titles, a content delivery platform to control and lend materials to patrons, and e-book reading apps or interfaces that patrons use to discover, check-out, and read materials. These services are essentially end-to-end environments that provide valuable services to libraries but with limited flexibility.

These commercial services include their app or interface used by patrons for interacting with the digital content. Overdrive, for example, offers Libby, an e-book reading apps for Apple, Android, and Windows. Introduced in 2017, Libby offers substantial improvements in user experience over the original Overdrive app.

These commercial offerings have found broad acceptance in the public library arena. Almost all public libraries in the United States offer a digital lending service, with Overdrive currently ranking as the dominant provider. That said, libraries are not entirely satisfied with the current environment due to high costs and restrictive license terms. The commercial providers take the brunt of the frustration on e-book pricing and lending restrictions but are only passing along the licensing terms offered by the publishers. Beyond costs and lending restrictions, other areas of ongoing concern involve branding and interoperability. Libraries often express concern that the e-book lending service they support is perceived by their patrons associated with their provider and not their own brand or identity. Once the Overdrive Libby app has been installed on a library patron's device, for example, subsequent search and selections of e-books take place entirely within Overdrive's ecosystem. This scenario means that patrons may not necessarily encounter resources the library acquires from other providers or materials in its print collection or other services. While seeing great value in working with commercial e-book providers, libraries are also interested in additional arrangements that expand options and add more openness and flexibility in their digital lending services. For many public libraries, digital lending is increasing relative to loans of physical materials, making this issue an important long-term strategic concern.

## A Public, Non-profit Alternative

This interest in exploring new alternatives for e-book lending services for public libraries is driving a group of initiatives that are coming together in a new digital lending environment based open source software and a non-profit content marketplace. Key players behind this initiative include DPLA, NYPL, and LYRASIS.

Addressing the need for a library-branded e-book lending service for libraries, NYPL led the development of an open source digital lending app called SimplyE. The development of SimplyE began in 2015, carried out primarily at NYPL, to create a library e-book app that was substantially easier to use than the commercial products then available. It aimed to collapse the complex process for a patron to borrow an e-book from the library down to three clicks. SimplyE prioritizes availability rather than popularity in search results, resulting in shorter wait queues and increased use of materials.

NYPL launched SimplyE to its patrons in early 2016, providing access to content from the three major library e-book providers—Overdrive, bibliotheca cloudLibrary, and Baker & Taylor Axis 360.

SimplyE was developed as open source software and has been made available to the broader library community. Some libraries or consortia have implemented SimplyE, including the Califa group through a grant from the California State Library. Support services for libraries interested in deploying SimplyE are available from LYRASIS, which also provides governance and support for other open source projects including DSpace, Fedora, CollectionSpace, and ArchivesSpace. Odilo, a digital lending provider based in Spain has also integrated SimplyE with its platform.[2]

The Library Simplified Circulation Manager provides the technical connections and business applications required in support of a digital lending. The circulation manager can operate with the SimplyE app or others that follow the Open Distribution for Libraries protocol. It has been designed to work with multiple content distribution platforms including the DPLA Exchange, Overdrive, bibliotheca cloudLibrary, and Axis 360. This open environment enables libraries to acquire digital content resources from multiple providers and make them available to patrons through a single app. The Library Simplified Collection Manager provides comprehensive analytics spanning all the library's digital content providers.

DPLA has created a new catalog and marketplace of digital titles available to libraries called the DPLA Exchange.[3] DPLA has engaged with publishers to gain access to titles under similar terms as have been offered to the commercial library digital lending providers. The DPLA Exchange provides an interface where libraries can select and pay for titles of interest as well as browse and select titles from a large collection of open content. While the DPLA Exchange offers an expanding catalog of content, it is currently used mostly to supplement rather than replace the digital materials acquired from other providers. Although the licenses initially offered resemble those made available through the commercial providers, more attractive terms may be possible in the future.

Each library or consortium implementing this environment will need its own instance of the Library Simplified Circulation Manager. Library organizations can deploy this open source software directly, or they can contract with LYRASIS for hosting services.

## Pilot Project

This initiative for an open digital lending environment was introduced in October 2017 as a pilot project. Libraries participating in the pilot phase included the Carnegie Library of Pittsburgh, the Alameda County Library in California, Connecticut State Library, the Califa Library Group including members in California and Kansas, the Saint Mary's County Library in Maryland, and the Yavapai Library Network in Arizona.

## Toward a National Digital Lending Platform for Libraries

Following successful testing in the pilot phase, the initiative announced in April 2019 its ambitious agenda to develop a national digital lending platform for libraries. The initiative continues the collaboration of DPLA, NYPL, and LYRASIS and will be available to all public libraries in the United States. The SimplyE Community Leadership Advisory Council has been established to provide insight, guidance, and oversight as the project develops.

This initiative represents an important step in the advancement of digital lending in public libraries. While the lending of physical materials will persist in public libraries indefinitely, digital services will continue to grow and become increasingly important.

# Executive Changes at Innovative

Innovative Interfaces announced a change in its executive leadership at the recent Innovative Users Group meeting (May 6, 2019, Phoenix, AZ). The company's Board of Directors has appointed Shaheen Javadizadeh as its new Chief Executive Officer (CEO). James Tallman will take the role of Executive Chairman and will continue in an advisory role with the company, providing continuity with the strategies established under his tenure.

Javadizadeh joined in October 2016 as Executive Vice President of Global Sales and Marketing. He has been part of the strategic planning and management of Innovative since the beginning of his tenure. He came to Innovative from Wolters Kluwer Enterprise Legal Management (ELM) Solutions, where he served as Vice President for Strategic Markets. Prior to Wolters Kluwer, he held executive positions at Datacert and Mitratech Holdings, which also provided enterprise software for the legal industry.

Other recent executive changes include:

- **Chris Fields**, Innovative's Chief Technology Officer (CTO) since September 2016, recently left the company to become CTO of Onit, Inc., a provider of enterprise workflow solutions for enterprise legal management, which competes in the same arena as Wolters Kluwer ELM Solutions.
- **Joe McMorris** was appointed as Global Chief Information Officer in December 2018. McMorris joined Innovative from Wolters Kluwer, where he served in a similar capacity.

Several members of Tallman's executive team were associated with him through positions at Wolters Kluwer ELM business unit and Datacert. Datacert became part of Wolters Kluwer in August 2014 through the acquisition of its parent company, Third Coast Holdings. At the time of that acquisition, Tallman was CEO of Datacert; Javadizadeh was Vice President for Global Markets; Schad was Senior Vice President for Customer Operations; and Fields was its CTO. Akin Adekeye served as Associate General Counsel for Wolters Kluwer ELM Solutions from 2012 through April 2015 prior to joining Innovative as its General Counsel. Tallman and Javadizadeh worked at competing companies prior to working together at Datacert. Recruiting individuals from prior business associations is a common practice with precedents in the library technology industry. Several executives at Ex Libris, for example, had previously held positions at NICE Systems.

Innovative continues under the ownership of JMI Equity and HCCG (formerly Huntsman Gay Global Capital). This pair of private equity firms acquired the company from its founder Jerry Kline through two rounds of investment in March 2012 and February 2013. Since that time, there have been several changes in executive leadership:

- **Kim Massana** served as CEO from August 2012 through August 2015.
- **Albert E. ("Bert") Winemiller**, an operating partner for JMI, served as interim CEO from August 2015 through January 2016. Winemiller continues to serve on the Board of Directors of Innovative.
- **James Tallman** served as CEO from January 2016 through May 2019.
- **Shaheen Javadizadeh** was appointed CEO in May 2019.

Innovative acquired Polaris Library Systems in March 2014 and VTLS in June 2014. The company continues to support a broad portfolio of products including its Sierra and Polaris ILSs, the Encore discovery interface, INN-Reach resource sharing framework, SkyRiver bibliographic services, the MyLibrary! mobile app, and the Vital digital repository. Its current development strategy, as covered in the May 2019 issue of *Smart Libraries Newsletter*, focuses on a new suite of products built on a new generation platform branded as Inspire.[4]

As Shaheen Javadizadeh takes on the role of CEO for the company, we can expect the formation of a new executive team to help him take the company forward in its support of a global customer base of libraries of all types and sizes. Innovative is well into its transition from a company that has previously taken a more conservative product evolution strategy to one based on creating entirely new products built on a modern technology platform. This strategy depends on the company providing long-term support for its existing products to retain and attract new customers as its new generation products gain functionality and maturity. Javadizadeh comes to Innovative's top leadership position at a time when the company faces significant challenges as well as new opportunities for change and advancement.

# Ex Libris Consolidates Discovery Indexes

Consistent with previous announcements, Ex Libris is creating a single discovery index that will power both of the company's discovery products, Primo and Summon.[5] Following the acquisition of Ex Libris by ProQuest, the company's product portfolio included two index-based discovery products, each with distinctive interfaces and features. At the time of the merger, the company assured its customers that both products would be supported indefinitely. Both Primo and Summon are widely implemented in academic libraries. Given the substantial differences between Summon and Primo, combining them into a single interface will likely not be well accepted by customers.

Both Summon and Primo rely on massive article-level indexes that address a broad representation of the global scholarly and professional literature. These indexes each require substantial resources to manage and maintain. In the initial phase following the merger, processes were put in place to ensure that the content indexed by both products was consistent and to address gaps in coverage.

Ex Libris has moved to the next phase of integration where a single Central Discovery Index will be created to power both Primo and Summon. This new index will enable faster and more efficient ingestion of content. The new Central Discovery Index will also provide a stronger foundation for new services within the discovery products and to make use of artificial intelligence and other relevant technologies. Ex Libris anticipates that the migration to the new index will be a smooth process for its Primo and Summon customers. The initial transition is planned for later in 2019 with most libraries making the change in 2020.

# Smart Libraries Q&A

*How can libraries effectively market their institutional repository?*

Libraries invest considerable effort in deploying institutional repositories and in maintaining their content and metadata. It's a reasonable concern to ensure that these services are well used, and many libraries engage in outreach or marketing activities to promote them. These efforts can include encouraging researchers to deposit documents or data into the repository as well as promoting their use. Libraries continue to be strong supporters of open access publishing and view institutional repositories as an important component of that ecosystem.

Institutional repositories serve an important role in providing an official centralized place for research papers or other publications. More recently, their role has been expanded to house the underlying data and related materials. An institutional repository aggregates content authored by individuals throughout the university, providing safe, long-term storage of these documents in a way that they can be easily discovered and accessed by others, including the global research community. These repositories are much safer and more reliable than alternatives such as posting papers on each faculty member's web page, which at one time was the common practice.

Within universities, libraries have been the traditional champions of institutional repositories, taking on the role of deploying the technical platforms and providing any needed assistance. They have been advocates for open access publishing of scholarly content and have implemented institutional platforms as supporting infrastructure. These repositories have mostly been based on open source applications such as DSpace, Fedora, or Samvera, though some have also engaged with commercial providers such as bepress. In addition to providing the platform, libraries also contribute services such as submission support, metadata enrichment, digital preservation, and advocacy.

The vision of institutional repositories has often included the ambitious goal of capturing the entirety of the scholarly and research output of the academic institution, though few attain that level of participation. The portion of research papers contributed can be expected to be quite high when university policies mandate deposits in the institutional repository. External funding organizations may also require deposit of research materials into open access platforms, through the institutional repository may be only one option. Research funded through the National Institutes of Health, for example, requires that manuscripts or article be submitted to PubMed Central. Regardless of whether it is an institutional or funder mandate, having formal requirements that become part of the standard research publication workflow can be seen as the most effective way to ensure that scholarly articles are deposited into open access repositories.

Many academic libraries have incorporated responsibility for the institutional repository into one or more professional positions. For those with locally-hosted platforms, the library's IT team may be involved with technical operation and its data backup and preservation. It is common for responsibility for the institutional repository to be part of the portfolio of a scholarly communications librarian or to dedicate an entire position to this role.

With that context, we can turn to the question of how a library can better market its institutional repository. Different activities apply to encourage researchers to deposit documents than to promote access to the repository.

Increasing the contributions of content to an institutional repository involves a combination of organizational and individual advocacy. As noted above, the most important factor in gaining participation in an institutional repository comes in the form of mandates. In many institutions, librarians and other stakeholders have collaborated with the administrators responsible for the research activities in the university to develop policies that require, or at least encourage, that scholarly articles be submitted to the institutional repository or other open access platforms. With these policies in place, the library can facilitate compliance by developing procedures that explain how to deposit a manuscript or paper that can be disseminated through local community of researchers. The library should also be prepared to provide support services to provide any help that researchers or their assistants might need in making their submissions.

For those institutions were the submission of research papers to open access repositories is discretionary, the role of the library to promote the service is more challenging. Librarians can take a proactive approach by working with

academic departments and individual researchers to reinforce the advantages of submitting materials into the repository or contributing to other open access channels to increase the exposure of their work. Creating a streamlined submission process that requires minimal instruction or effort may help allay resistance. Researchers may be more attuned to other venues that offer a broader and more community-oriented platform such as ResearchGate, SSRN, Humanities Commons, Academia.edu, or other networks of interest. The competition for academic research engagement is increasing and the bandwidth of researchers in the academic institution is limited.

In addition to efforts to populate the institutional repository, the other concern involves ensuring that the content receives an appropriate level of access. Promoting an institutional repository as a discrete destination is not likely to gain more than marginal results. Rather, the key strategy for strengthening access lies in integrating the content into local and global discovery environments. The normal mechanism for dissemination of the content into other discovery services is OAI-PMH (Open Archives Initiative Protocol for Metadata

Harvesting), which all the major repository platforms support.

Libraries with an index-based discovery service will naturally want to include the metadata from the repository. It's common practice for these discovery services to incorporate metadata from the local ILS, the institutional repository, or digital collections in addition to the global indexes of scholarly content. It's also important to be sure that the repository is harvested by key search services such as:

- OAIster, a union catalog of open access resources now managed by OCLC.
- Unpaywall, a database of open access content used by many search services, including browser plugins that match citations to open access copies of articles.[6]
- Direct inclusion in index-based discovery services.[7]
- Google Scholar, which inclusion in Google Scholar should mostly happen automatically, but see its "Inclusion Guidelines for Webmasters" for details on optimizing harvesting and indexing.[8]

## Notes

1. Digital Public Library of America, "New Collaborative Effort to Develop a National Digital Ebooks Platform for Libraries Announced," news release, April 18, 2019, https://librarytechnology.org/pr/24227.
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3. For more information, see "Homepage," Digital Public Library of America Exchange, accessed May 10, 2019, https://exchange.dp.la.
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5. Ex Libris, "Ex Libris to Upgrade Its Primo and Summon Indexes, Consolidating Them into a Unified Central Discovery Index," news release, April 29, 2019, https://librarytechnology.org/pr/24251.
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8. "Inclusion Guidelines for Webmasters," Google Scholar, accessed May 10, 2019, https://scholar.google.com/intl/en-US/scholar/inclusion.html.

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Contact Samantha Imburgia at **simburgia@ala.org**

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