Smarter Libraries through Technology

Looking Forward to 2017

By Marshall Breeding

The advance of a new year on the calendar prompts consideration of what we might expect in the next phase of library technology. Avoiding any attempt at exact predictions, at best we can extrapolate from existing trends to make informed projections and set expectations within areas of interest. Technology planning requires at least a degree of anticipating the future in order to shape strategies and prepare long-term budgets and resource allocations. Areas of interest where we can make some predictive observations include the next phases of library services platforms and integrated library systems (ILSs). These genres of resource management systems remain distinct, with differing directions of strategic development. The privacy of online patron activity has become a critical concern, which stands out as a priority for attention by both libraries and the vendors providing technology products. Since business transitions can have a major impact on the products and services available to libraries, it is always important to monitor relevant industry conditions.

Building Out the Platforms

The genre of library services platforms has become well established, especially for academic libraries. These products, in development since 2009 and in production since 2012, provide business process automation with workflows better optimized for the current reality of multi-format collections than the traditional ILSs. Delivered through multi-tenant platforms, these products have seen continual enhancements since their initial deployments. While the satisfaction with these platforms is far from perfect, they can be seen as providing technical infrastructure to help libraries address their operational requirements for resource management and service delivery with increasing sophistication. The library services platform aims less at replacing the detailed functionality embodied within the ILS, and more towards providing the technical infrastructure to support activities aligned with current strategic priorities. In addition to the embedded functionality, these platforms expose APIs that can be exploited to address additional needs for data exchange, interoperability with external systems, or the creation of new applications or widgets.

Building on the foundations of the library services platform, the next phase of library technology for academic libraries will be seen in the delivery of new products and services addressing the increasing bounds of involvement that academic libraries have assumed within their institutions. Academic libraries find themselves increasingly interested in going beyond the traditional roles of building, maintaining, and facilitating access to print and electronic collections. This traditional role persists as the foundation of library services to the university, but exploring new opportunities beyond the core can help strengthen its value. The development of library services platforms and other strategic technology infrastructure continues in two directions: filling gaps in functionality related to resource management and in extending their scope to address new areas of library involvement.

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Many academic libraries seek to increase their strategic position through closer involvement with the research process, such as in providing new services related to research data. The creation of data management plans as well as the organization, preservation, and management of research data tap into the core areas of expertise of libraries and help to strengthen their value to the institution. I anticipate that extending the library services platform to address various aspects of managing research data will be one of the key enhancements to library services platforms in the near future. These capabilities could be addressed either through a new suite of functionality created within the existing workflows and interfaces or through new applications or modules operating adjacently that take advantage of the core platform services and functionality. In this era of library services platforms, creating new standalone applications can be seen as promulgating fragmentation compared to leveraging the library's existing strategic infrastructure.

The library services platform must also be better leveraged to address the resources needed in support of the curriculum. The genre of index-based discovery services has seen mixed results as a tool for students and researchers to gain access to the materials in the general body of scholarly information of interest. With the majority of students and researchers relying on tools on the broader web, such as Google Scholar, library-provided discovery services address a niche of research activities centered on subscribed and open-access materials specifically vetted by the library. These index-based discovery services provide an important service to students and faculty that happen to visit the library website and perform their research through the tools provided. In reality, only a subset of research is conducted through library-provided interfaces, making it essential for libraries to exploit other channels more directly within the daily routines of students and instructors.

The learning management system plays a crucial role within the university as a mandatory interface for students and instructors. Most educational institutions have implemented one of these platforms with increasingly high adoption as the strategic platform through which the activities of university classes are conducted. Thus, it is increasingly essential that libraries find points of entry into the learning management system to deliver access to their print and electronic resources and other services. It is not necessarily realistic for libraries to assume that students and instructors will always go out of their way to figure out the tools that the library offers on its own website to discover and access materials used for their courses. While some, or even most, course materials may be available from the library, it is essential to provide discovery and access to these materials through the learning

management system itself. This reality drives the need to provide services via the learning management system that tap into the resources provided by the library.

The genre of reading list management tools has been established in the higher educational sector of the United Kingdom for a few years. Products such as Aspire from Talis and the open source rebus:list application developed and supported by PTFS Europe have been leaders in establishing this genre. Technology products designed to offer better support for incorporating library resources into learning management systems have come much later to North American universities. In the last couple of years, EBSCO has introduced its Curriculum Builder, and Ex Libris has introduced Leganto to address this need. The phase of dedicated electronic course reserves seems to have waned. Many libraries have abandoned these programs since faculty and research assistants have started to manage the required and supplemental articles and book chapters directly through their course pages in the learning management system. In many cases, these materials were not well coordinated with the resources provided by the library. Personal copies of an article from the instructor might be scanned rather than linked to a digital version available through the library's subscriptions. The creation of extensions to library services platforms or discovery services that tap into institutional learning management systems helps the library to assert its role in supplying the information resources in support of teaching. This approach enables the institution to optimize investments made in the library's content subscriptions and improve copyright compliance.

Integrated Library Systems

The ILS continues as the prevailing model for the automation of public, school, and most special libraries. This genre of technology product has evolved over at least three decades, maintaining its general organizational structure for data and functionality and has been adapted to the architectures of each major technology cycle. Its innate orientation to workflows and data structures favoring print resources can be seen as the impetus for the creation of the genre of library services platforms to serve academic and research libraries that need to manage multi-format collections. These collections are dominated by electronic and print materials. Yet the ILS continues to prosper among other types of libraries that remain more book oriented. Even as these libraries increasingly become involved in e-books, ILSs have been able to evolve to accommodate them without changing the foundational automation model. The structure of bibliographic records with associated holdings can easily accommodate electronic versions.

Regardless of the underlying drivers, so far only academic libraries have moved in large proportions to library services platforms, and ILSs continue to dominate the automation of other library types.

Accelerated Shift to Web-Based Interfaces

The transition from workstation-based staff clients to web-based interfaces stands out as the key technology trend for ILSs. Most of the major ILSs today utilize software that must be installed on local computer workstations for use by staff members. These staff clients can provide efficient interfaces but require considerable work to install and constant upkeep as new versions are produced. In this current phase of information technology, almost all new business software in other sectors makes use of web-based interfaces. The library arena has been behind the curve in making this transition, though incremental progress has been made over the last two or three years. Progress has been hampered previously by the difficulty of programming the complex editors and workflow tools into web-based forms and templates. With the advent of HTML5 and sophisticated JavaScript frameworks, such as jQuery and Bootstrap, the gap between what can be accomplished in a graphical desktop versus a web interface has closed. For the integrated systems that still require workstation-based staff clients, I anticipate that this year will be one of significant progress. This transition to web-based interfaces for staff functionality seems long overdue.

Vendor Hosting

Another trend that will accelerate in the coming year involves increasing proportions of ILSs hosted by the vendor instead of the library or consortium. Vendor hosting has become the preferred deployment model for the majority of new ILS implementations. Even libraries not interested in changing ILSs will shift to vendor hosting services when their local hardware comes to the end of its life or when local data center arrangements change. Many institutional data centers have changed their attitudes from avoidance of hosted servers to acceptance or encouragement. As more vendors gain certifications for security and quality assurance with rigid terms of service, institutional information technology administrators see hosted services as beneficial in terms of risk and cost. From the library perspective, moving to a hosted environment enables local technical personnel to refocus their work on high-level services instead of routine server and network administration. Many library products are offered only through software-as-a-service (Saas), where local hosting may not even be possible.

These products would include all the library services platforms and index-based discovery services. The model of purchasing software to be installed on local servers will be increasingly rare, implemented only when required by special circumstances. This shift in technology has major changes for technology budgets, with less spending on individual hardware and software components and facilities, displaced by inclusive SaaS subscription fees.

Privacy and Security

Despite the prevailing attitudes and policies in the library profession concerning the protection of patron privacy, the adoption of technologies to safeguard data related to online patron activity on library provided interfaces has been lax. The number of libraries that currently use HTTPS to encrypt their websites, catalogs, discovery services, and other web-based services remains low. This was demonstrated by data collected and reported for an issue of *Library Technology Reports* that I authored on the topic and on my subsequent observations. Many factors are now in play that should accelerate the adoption of HTTPS in library interfaces. These factors include higher awareness of vulnerability to domestic and international electronic surveillance as well as a variety of initiatives within the commercial sector, the Electronic Frontier Foundation, and library-specific initiatives. HTTPS will soon become the expected transmission protocol for all web-based activity. Web browsers will soon begin presenting warnings for sites transmitting via unencrypted HTTP, and search engines may give preferential ranking to content delivered through secure protocols. Early adoption of secure transmission technologies would be consistent with library ethics and values. Unfortunately, libraries have been slow to make the transition. Heightened awareness by libraries and proactive measures taken by vendors could drive a rapid transition to secure handling of patron interactions with library resources in the coming months. This remains an urgent and pressing challenge.

Business Activity

Mergers and acquisitions has been a continual theme in the library technology industry for the last two decades. Each year brings another set of business events resulting either in incremental change or larger-scale transformation of the industry. 2016 fell into the former category, with no major events changing the dynamics of the industry. The acquisition of Baker & Taylor by Follett was the biggest event of the year, with no major impact on the library technology division of Follett. On the international front, Axiell acquired the German ILS

vendor BiBer, and OCLC acquired its small distributor in Italy (IFNET). Compared to 2015, which saw major events such as the acquisition of Ex Libris by ProQuest and 3M Library Systems becoming part of Bibliotheca, this year was quite calm.

Of course, it is not possible to predict specific business events that may take place in the coming months or years. It would be highly unusual for the industry to go a year without some activity. But in the current highly consolidated industry, few opportunities remain for mergers among competitors. It would not be surprising to see one or more companies see new ownership arrangements, especially among those held by private equity investors. I anticipate that the coming year will

instead be characterized by activities related to the business integration and strategies put in place as a result of the major events of 2015. This timing would be consistent with the process of business integration and the execution of strategies emerging from merged organizations.

Smart Libraries Newsletter covers the major events, products, and companies of the library technology industry. In each issue, we aim to provide objective reporting and informed perspective. Time will tell whether the events of the coming year will follow the trends we have anticipated or veer in other directions. Either way, I'm sure it will be another interesting year in the realm of library technologies.

Biblionix: New Integration Capabilities for Apollo

Biblionix, the company behind the Apollo ILS for small public libraries, has created a variety of new enhancements that provide better integration between its catalog and the library's website.

Developed as a multi-tenant platform, libraries have until now accessed their version of the Apollo ILS through a URL referencing Biblionix's own domain (example https://mylibrary.biblionix.com/catalog/). The company now offers libraries the capability to deploy their catalog via their own domain name (example: https://catalog.mylibrary.org). The ability for a library to provide both its catalog and its website via its own domain name strengthens its brand and identity. This approach provides an opportunity for the library to avoid using a domain that associates its catalog as a commercial service (.com). It has become an almost universal practice for library vendors that host library catalogs to deploy the catalog using their company's domain name. Biblionix has set an important precedent by creating an option for libraries to both benefit from a fully hosted service and maintain this key aspect of their virtual identity.

Biblionix was also one of the first library technology vendors to deploy both its staff and public web interfaces through mandatory HTTPS, providing a high level of privacy and security for patron data and other sensitive operational data.

The company also introduced a new single sign-on capability for access to subscribed electronic resources. Library patrons can use their user and password credentials from Apollo to sign in to the website and access any restricted resources without the need to re-authenticate.

Biblionix has also created a widget that enables the library to present a moving carousal of book cover images on its website. Clicking on an image takes the patron to the corresponding record in the Apollo catalog. This widget provides an interactive way to feature collection items.

All of these new features are optional and available to Biblionix customers without additional cost. As a system designed and priced for small public libraries, Apollo has gained a set of features that aim to help improve their presence on the web without undue burdens of cost or complexity.

HighWire Press Acquires Semantico

Business consolidation continues through almost all industries. Mergers and acquisitions have reshaped all aspects of the library technology industry. In the scholarly publishing arena, HighWire Press has acquired Semantico, a company based in

the United Kingdom that also provides technology and services for digital scholarly publishing. Semantico brings to HighWire a set of technologies complementary to its existing publishing and journal management platforms as well as a major expansion of

its client base. All the operating facilities, personnel, and products of Semantico will continue as it joins HighWire Press. This acquisition reinforces HighWire Press as the leading provider of services to the scholarly publishing community.

HighWire Press was launched within the Stanford University Libraries in 1995 as one of the earliest online publishers of scholarly journals and has steadily expanded its portfolio of publications. In the subsequent two decades, it has steadily increased the number of publishers for which it provides technology-based services for hosting and manuscript processing. The company hosts over 3,000 journals and related resources, which will expand to more than 4,000 journals spanning 160 publishers following the acquisition. Apart from the acquisition of Semantico, HighWire Press was already in a phase of expansion. It opened a new office in Belfast, Northern Ireland in March 2016 and will include personnel involved with engineering, professional services, and project management. Its Belfast operation is expected to expand to 74 personnel over the next three years.

The ownership of HighWire Press, based in Los Gatos, CA, is split between a private equity investor and Stanford University. In May 2014, Accel-KKR, a private equity firm specializing in technology-oriented business with over $4 billion in capital, acquired the majority ownership of HighWire Press with Stanford University continuing as a significant minority owner. This transition saw a shift from a non-profit to a for-profit business model. Dan Filby has served as Chief Executive Officer since March 2015.

Semantico is based in Brighton, UK with an additional office in New York. Both facilities will continue to be operated as the company becomes part of HighWire Press. The acquisition of Semantico will almost double HighWire's personnel in the United Kingdom and will significantly strengthen its capacity to serve clients in Europe.

HighWire Press gains significant technology components to complement the platforms it has previously developed in support of the management and publishing of scholarly journals.

The following technology platforms were developed by HighWire Press:

- JCore (Journal Core), a journal publishing platform based on the open source Drupal content management system
- Folio platform for publication of scholarly e-books, which was introduced in October 2013
- Impact Vizor and Usage Vizor, a suite of visual analytics tools
- BenchPress manuscript submission and peer review management system

The following technology platforms were developed by Semantico:

- Scolaris publishing platform
- SAMS Sigma, an identity management service

HighWire Press has grown organically over its two decades of operation from its initial work to create the *Journal of Biological Chemistry Online* in 1995. To survive and prosper over this period, HighWire Press has navigated through a variety of transformations. On the technology front, it has refreshed and expanded its publishing platform and tools, including a shift from its earlier H2O platform to its current Drupal-based JCore. It has developed tools to facilitate the submission and peer review of manuscripts and developed analytical tools required by publishers and scholars. On the business front, the organization has grown from a project launched by Stanford University Libraries into a successful entrepreneurial spin off. In its most recent phase, it won the attention of investors able to fund its expansion into the UK to better support the scholarly publishers throughout Europe and beyond. This business acquisition both further strengthens its business presence in Europe and brings in additional technology components that complement its existing offerings. While business of services for scholarly publishers is somewhat adjacent to the sector providing technology directly to libraries, which is the core focus of *Smart Libraries Newsletter*, it exemplifies many of the same technology and business trends.

Update on Ex Libris Alma

In addition to features on major new initiatives or events in the library technology industry, it is also important to track the ongoing progress of established companies and products. In that vein, Ex Libris has seen considerable momentum with Alma and related products since the major business transition, which we have covered in previous issues of *Smart Libraries Newsletter*.

Alma has been selected in recent months by a variety of important academic libraries and consortia. Some major announcements include:

- Harvard Library, the largest academic library globally with collections exceeding 21 million volumes, announced in December 2016 that it had selected Alma to manage its collections across its 70 facilities. The library has used Ex Libris Aleph since 2001 and selected Primo as its discovery environment in 2014. Among the members of the Association of Research Libraries (ARL), 33 have selected Alma to date. Counting the 24 using Voyager and 12 using Aleph, 55 percent of the ARL members have opted for an ILS from Ex Libris.
- The South Dakota Board of Regents selected Alma and Primo for its network of public colleges and universities throughout the state.
- The University of Bergamo in Italy announced that it will migrate from Ex Libris Aleph to Alma. It had previously implemented Primo as its discovery environment.
- Venturing a bit outside of its core market of academic libraries, ACT Health selected Alma for managing health information resources for its facilities in Australian Capital Territory.
- The University of Haifa, which selected Alma last year, became the first library in Israel to place the service into production in November 2016.
- Eastern Michigan University announced its selection of Alma in November 2016 and will be the first to integrate it with Summon as its patron interface instead of Primo.

Ex Libris announced a new product suite called Leganto powered by SIPX. This offering combines the Leganto application for the management of course reading lists announced in 2015 with SIPX, a platform for gaining savings for course materials by leveraging library collections and tracking copyright. Leganto relies on services provided through a library's implementation of Alma, though its functionality is provided via the institutional learning management system. SIPX, originally created by a group within Stanford University, was spun off as an independent business in 2012 and acquired by ProQuest in April 2015. Following the acquisition of Ex Libris by ProQuest, responsibility for SIPX shifted from its Bowker affiliate to Ex Libris. By combining these two products into an integrated package, Ex Libris is able to offer a sophisticated set of capabilities for the creation of course lists via the institutional learning management system, copyright management, and other tools to help reduce the costs students pay for course materials. Ex Libris has initially positioned its offering of Leganto powered by SIPX to libraries in North America.

Aimed to better support tasks performed by library staff away from service desks, Ex Libris has released the Alma Mobile App. Its initial functionality helps library staff members retrieve items from the shelves that have been requested. The app can use the camera on the device to read barcodes. Alma Mobile can be used by both Apple's iOS and Google Android. Alma customers, including those at the libraries of Colorado School of Mines, Macquarie University, and the University of Sheffield, worked with Ex Libris in the design of the mobile app.

Smart Libraries Q&A

In this issue, we launch a new regular feature where Marshall Breeding, the editor and primary contributor of *Smart Libraries Newsletter*, addresses a topic posed by a reader. Those wanting to submit questions or topics for future issues can send them to Samantha Imburgia, Associate Editor for ALA TechSource at **simburgia@ala.org**.

What suggestions do you have for small libraries with limited staff and budgets that are trying to adopt new tech and migrate from existing platforms?

Small libraries face incredible challenges in keeping up with technology. I have long been concerned that libraries serving small communities and rural areas often lack the funding and personnel they need to be able to offer technology-based services similar to larger public libraries. Small libraries in many other settings likewise lack adequate resources. Regardless of the resources available to the library, the communities they serve require and deserve the same level of services provided by larger libraries.

The library technology industry has not favored small libraries. Vendors scale the cost of technology products and services according to the cost and complexity of the library. It's reasonable that larger organizations pay more for the same software since they will use it with much more complexity to manage and provide access to larger collections. The pricing

models, however, do not necessarily scale down to levels accessible by the smallest tiers of libraries.

In light of these realities, there are still many strategies available to small libraries that may help in their adoption of effective technologies.

- Don't face the problem alone. Implementing technology for a single library results in the least efficiency possible in terms of cost and effort and results in the least effective impact for patrons. Small libraries can seek opportunities to join in with other systems or consortia, buying in to share a system at a lower cost than their own standalone implementation. The systems operated by larger libraries may also provide more features and sophistication and, more importantly, would enable a small library to provide access to a larger collection representing the combined holdings of the partnership. Joining a consortium may also come with access to technical personnel, who can help with other aspects of the library's website and related services.

- Seek appropriate technology solutions. For those small libraries that must go at it alone, it is important to identify technology products that are well suited for the context of a small library. The functionality should be designed for your type of library. Going with a lower-cost product not necessarily oriented to your needs can be a point of frustration. Many small public libraries, for example, have implemented systems designed for K-12 schools mostly because of low cost. It's more beneficial to seek a better fit, even if it costs a bit more. Small libraries also will find fully web-based hosted products to be much easier to implement and operate than those that require software to be installed on library computers.

- Some small libraries may be interested in open source automation components. Given that open source software

does not come with licensing costs, it can be an attractive option financially, but may be challenging for small libraries lacking personnel with strong technical expertise. A number of commercial firms specialize in services to implement, host, and support open source ILSs. The service fees involved may be a good value for many small libraries.

The core library automation system is just one component of the technology that libraries depend on to support their work and serve their patrons. The library's website represents another critical area of concern. In the course of my work, I visit the websites of many libraries. It's not surprising that smaller libraries tend to have a less than stellar web presence. Fortunately, it's getting easier to build great looking websites with popular content management platforms, such as WordPress. Rather than struggling with raw HTML, most small libraries will get better results using a content management system. They may want to seek an external expert—hopefully someone with a library perspective—to get it set up. Afterward, keeping the site up to date will be a routine, nontechnical activity.

Small public libraries should not have to settle for mediocre technology. These libraries need great technology to support their work even more than larger ones. I continue to hope that the disparities in technology available across the library spectrum will narrow. It's hard to be hopeful that the funding to small libraries will improve substantially. The trend toward hosted web-based technology services should help small libraries considerably since they have a much lower level of difficulty to implement and maintain. But I see the main path forward for small libraries in collaboration with peers and partners with mutual interests in efficient and affordable models to gain access to appropriate technology solutions.

Questions or suggestions for topics in future issues?

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