Smarter Libraries through Technology: Reviewing the Past Year, Anticipating the Next

By Marshall Breeding

The new year presents the chance to review changes in library technologies and consider what we might anticipate for 2016. The sweeping changes that transformed the industry last year set the stage for events in the coming year.

A quick review of the events and developments covered by this newsletter in 2015 highlights an industry in a phase of aggressive consolidation, bringing ever larger forces to bear on creating and supporting technology products and services for libraries. Libraries likewise increasingly consolidate their resources to leverage large-scale technology implementations, increase the impact of their collections, improve efficiency, and reduce their costs of operations. Yet libraries demand technologies that effectively meet unique business needs, foster engagement with their communities, and strengthen strategic positions. Innovation, though not a goal in itself, is expected as a means to break out of previously established patterns embodied in

systems that hamper libraries as they face ever increasing demands, budget constraints, and constant change.

Looking Back on 2015

Aggressive consolidation. The consolidation of the industry was covered our November 2015 issue that outlined the acquisition of Ex Libris by ProQuest, one of the most dramatic events in the history of the industry. Not only does it bring together two of the largest companies, it also represents a major step into the convergence of content distribution, resource management, and discovery. Both companies involved had themselves made strategic acquisitions. Ex Libris expanded into the realm of campus-wide mobile with its acquisition of oMbeil (June 2015 *Smart Libraries Newsletter*). ProQuest purchased the Coutts monograph OASIS acquisitions utility and MyiLibrary digital content platform from Ingram Digital. The acquisition of 3M Library Systems by Bibliotheca likewise represents aggressive consolidation in the self-service and automated materials handling arena (December 2015 *Smart Libraries Newsletter*). This merger produces a single globally dominant company in this sector, though challenged by smaller companies operating in each region.

The transition in ownership of Sirsi-Dynix notably did not contribute to further consolidation (February 2015 *Smart Libraries Newsletter*). Vista Equity Partners sold the majority of the equity in the company to ICV, a minority-owned and managed private equity firm. Its interest is in empowering the leadership of the SirsiDynix to develop businesses strategies both financially successful and that support communities in need. This lateral transfer of ownership of the company in the industry created through the

largest number of mergers in the industry may demonstrate the top end of consolidation of direct competitors. This outcome was much less disruptive than would have been the case had it merged with one of the other major ILS companies.

Library cooperation via shared infrastructure. Recent years have also seen a rise in libraries banding together in shared technology infrastructure projects. Now highly-scalable, sophisticated platforms, based on cloud computing technology and resource management and discovery systems, can handle ever larger groups of libraries, presenting opportunities for libraries to pool their resources through shared infrastructure. The September 2015 issue of *Smart Libraries Newsletter* focused on this trend of shared infrastructure, describing projects of the University System of Georgia, the Wales Higher Education Libraries Forum, the BIBSIS network in Norway, the California State University System, and the Washington State Board for Community and Technical Colleges, all of which have selected Ex Libris Alma. The Complete Florida Plus Program, including all the state university and community colleges in Florida, has opted for Innovative's Sierra. The selection of SirsiDynix Symphony as shared automation for all of the public libraries in Wales was covered in the October 2015 issue. Other technologies that support resource sharing continue to be advanced, such as the SHAREit platform for direct consortial borrowing across libraries with separate ILS implementations, which was covered in the July 2015 issue of *Smart Libraries Newsletter.*

Technologies emphasizing user experience, mobile, and engagement. Technology for the library must also provide exceptional user experiences for library patrons. Boopsie's platform to help libraries deliver their content and services to their community members' mobile devices was featured in the May 2015 *Smart Libraries Newsletter.* Boopsie has since been acquired by DEMCO in October 2015. In April 2015, we covered BiblioCommons, a company focused on providing discovery services and content management platforms, and its emphasis on user experience and customer engagement.

Open Source. Products based on open source software have become a routine part of the library technology landscape. Koha and Evergreen are well established open source ILS products. Kuali OLE, oriented to the challenging needs of the large academic and research library, has to date seen only limited adoption and remains in its development phase. We covered the transition of the Kuali projects in depth in the October 2014 *Smart Libraries Newsletter* and again with new information in the July 2015 issue. EBSCO, unlike its rival ProQuest, has opted not to create its own resource management platform, but rather has made strategic investments in open source alternatives. The March 2015 *Smart Libraries Newsletter* described a major grant EBSCO provided to the

Koha community to accelerate development, especially in the capability for Koha to integrate with EBSCO Discovery Service. Invenio, another open source product, was developed at the CERN library and has ben commercialized by TIND Technologies. The August 2015 *Smart Libraries Newsletter* provided an in-depth look at Invenio and its selection by the library of the Caltech.

In the January 2015 *Smart Libraries Newsletter* we covered the privacy and security of library systems. I have expanded and updated that study for an upcoming issue of *Library Technology Reports.*

Looking Ahead to 2016

Naturally any predictions for the library technology industry in 2016 are speculative. We can, however, think of developments likely to build on trends and trajectories or events that might disrupt them.

Possible business transitions. I expect at least some additional transformation in the business landscape of the library technology industry. The processes of business integration will take gradual effect following the recent set of mergers. The ProQuest Ex Libris deal is expected to close in January 2015, after which organizational and product strategies will be announced and executed. Barring any major stumbling in its upcoming implementations, Ex Libris under ProQuest is positioned to become increasingly dominant in large academic, research, and national libraries, and we can expect more large-scale, shared implementations. Innovative seems to still be working through the integration Polaris and VTLS acquired in 2014. Innovative must appoint a permanent CEO in the near future to replace the interim executive put in place following the abrupt departure of Kim Massana.

Given the level of activity seen recently, it seems reasonable to expect additional business activity in the next year or two. Private equity companies usually make investments for a limited term, leading to possible changes of ownership. These may simply sell to other investors, similar to the Vista Equity Partner's sale of SirsiDynix to ICV; strategic sales to direct competitors or companies in adjacent sectors is also possible, but less likely.

Growing involvement in open source projects. Open source will continue to be a key area of focus for libraries. Open source software aligns well with library values. Libraries with adequate development capacity will direct their efforts toward open source projects when possible; those lacking local technical expertise will increasingly explore the use of open source software supported externally.

Koha will continue its steady climb into larger numbers of libraries and into larger and more complex organizations. The

ILS most widely deployed in the world, Koha garners considerable interest and resources. The EBSCO grant was a big boost. The global community of developers continues to fix bugs, improve scalability, refine features, enhance interoperability, and expand functionality. I anticipate a steady path of adoption of Koha in small to mid-sized public, school, and academic libraries in the US and other industrialized countries, but gradual penetration into some larger libraries. Among developing countries, I expect Koha to further solidify its position as the dominant library automation system.

Evergreen, though a more scalable and consortium-oriented ILS, has not seen significant adoption outside the US, which is a possibility I would anticipate in the near future.

The Invenio open source repository and resource management platform, developed at CERN and supported by TIND Technologies, has attracted attention and seems well positioned for further adoption, especially by libraries oriented to science and technology or with large collections of documents. The characteristics of the Caltech and UN libraries resemble that of CERN and may represent a potential target audience for this product.

The Kuali OLE project stands at a critical point. The transition of the Kuali Foundation to a more commercial approach led by KualiCo has been underway since August 2014. To date Kuali OLE has not announced whether it will engage with KualiCo as have the larger Kuali Student, Kuali Financial, and Kuali Coeus projects. Only three libraries have implemented the system to date, and only for print resource management. Additional implementations anticipated to take place in 2016 and 2017 could accelerate the momentum of the project. The announcement by the hbz and GBV networks in Germany represent an important boost, with the potential for broader adoption among their member libraries.

Open source products are also becoming more firmly established in other genres of library-related software. In the repository arena, open source options such as DSpace, Fedora, and Hydra are widely adopted. Blacklight and VuFind provide popular options for open source discovery interfaces that integrate well into commercial article-level discovery indexes or e-book lending platforms.

Focus on user experience. I expect the trend toward delivering web-based library services with close attention to user experience to continue and expand. For public-facing services, the expectation for a modern web experience continues to intensify. On the broader web there has been a shift in recent years to heightened levels of usability, flat presentation styles, infinite scroll, and other deviations from earlier concepts of web design. Library-oriented products must be in close alignment with expectations established with patrons via other web interfaces and take advantage of the elegance and efficiency

they deliver. Engaging with their communities stands as one of the most important aspects of web-based library services.

This year, I expect to see many of the existing patron-facing products developed both by vendors and by libraries themselves redesigned following current principles of web design, especially including the ability to present content and functionality responsively to support all sizes of screens and devices. Progress will also be made to redeploy and redesign staff-facing interfaces provided through software installed on desktop computers to be provided through web-based interfaces. The replacement of staff workstation clients will accelerate this year both through replacement of legacy products with newer web-based services and through the redevelopment of existing products. SirsiDynix BLUEcloud, Innovative's LEAP, and The Library Corporation's LS2 Staff clients are examples of the latter; Alma and WorldShare Management Services reflect the reality that new products are based on web-native platforms.

Dominance of electronic, persistence of print. Despite the reality that electronic and digital content are an ever larger proportion of library collections, few libraries will be able to turn their attention away from print entirely. Public libraries, especially, will need to build and circulate print collections for the foreseeable future, but must also improve their capability to deliver access to e-books and other digital materials as an integrated service. The basic levels of e-book integration developed in recent years must be further refined and extended to include an ever more complex matrix of providers, including collections of e-books owned and managed by the libraries themselves. Capabilities related to e-book lending and integration will rise as a key differentiator of online catalogs and discovery interfaces oriented to public libraries. In large academic and research libraries, electronic materials overwhelm collection budgets, meaning that print collections must be managed more stringently. Services that assist libraries in identifying the print materials worth purchasing and provide data to help in weeding or selecting items for remote storage will be of rising value. Academic libraries work to develop spaces for patron study, collaboration, and creativity—usually at the cost of reducing the footprint of physical collections. These libraries will increasingly expect their resource management systems to provide built-in analytics and decision support for reallocating their physical collections.

Maturing API ecosystem. The functionality delivered in any one product will rarely meet in entirety the complex needs of large organizations. Many libraries expect to be able to extend functionality, connect diverse systems, mine internal data, or develop new interfaces or tools by making use of the APIs of their major technology systems. The quality and completeness of these APIs have become an important differentiating factor in the evaluation of systems. While the major

products oriented to large libraries now offer APIs, each follows their own conventions. I anticipate that the next phase of development will bring a more coherent and consistent ecosystem of APIs across diverse systems.

These are just some of the broad themes that I expect to see make the headlines of *Smart Libraries Newsletter* in 2016 and beyond. Naturally these suggestions should be taken only as food for thought. In the past, libraries often had very modest expectations from their systems vendors. The emergence of supersized companies with enormous capacity for

development leaves little room for excuses. I have high expectations for the technology-based products and services oriented to libraries. It will be interesting to see to what extent these expectations are fulfilled in the near future.

Despite this anticipated agenda of industry developments for the course of the year, no major events have transpired in the last month. Instead of providing in-depth description and analysis of a major topic or event, this issue of *Smart Libraries Newsletter* will instead provide a series of updates on a selected set of projects and companies.

OCLC Update: WorldShare, GreenGlass, and Governance

OCLC ranks as one of the prominent organizations in the library services arena, with increasing involvement in technology products. The progress of WorldShare Management Services (WMS), WorldCat Local and WorldCat Discovery, its acquired ILS products, as well as its resource sharing platforms and its collection analysis services have been covered in previous issues of *Smart Libraries Newsletter*. Recent months have brought incremental movement on multiple fronts, including ongoing adoption of WMS, new subscribers to its print collection analysis tools, and new appointments to its governing boards.

OCLC's Position in The Netherlands Strengthens

OCLC has been involved in resource sharing and library automation services in The Netherlands since its initial investment in PICA B.V. in April 1999. While it provides services throughout Europe, The Netherlands has been a focal point of activity. In the more than 15 years that have since transpired, the CBS platform for union catalog and resource sharing for consortia and the Lokaal Bibliotheek Systeem (LBS) integrated library system created by PICA continue to see use in many European libraries, with migrations to new systems beginning to take place only in recent years.

Most recently, the University of Groningen in The Netherlands selected WMS to replace its current LBS Lokaal Bibliotheek Systeem. The LBS integrated library system, originally developed by PICA, continues to be supported by OCLC as part of the portfolio of products managed by its EMEA division. The University of Groningen participates in the UKB consortium, which in February 2014 engaged with OCLC to migrate its metadata management, resource sharing, and discovery infrastructure to OCLC's WorldShare Platform. This move paved

the way for member institutions to also move to WMS as their primary automation system. Subsequently Delft University of Technology, Maastricht University, Vrije Universiteit in Amsterdam, and now University of Groningen have announced plans to migrate to WMS. UKB member Tilburg University had previously implemented WMS as an early adopter.

The majority of public libraries in The Netherlands also rely on automation systems supported by OCLC. In October 2013 OCLC acquired the Dutch library systems provider Huijsmans en Kuijpers Automatisering. As reported in the November 2013 issue of *Smart Libraries Newsletter*, HKA's bicatWise has been implemented in two-thirds of Dutch public libraries. At the time of the acquisition, the purchase price for HKA was not announced. OCLC's audited financial report for fiscal 2014-15, released in November 2015, indicates that HKA was acquired for €8,519,300, equivalent at that time to $11,523,200, financed via a bank loan for €6,500,000.

Adoption of WorldShare Management Services

Consistent with the practices of other providers of major library automation products, OCLC makes announcements of selected organizations that license WMS. In addition to those mentioned in press announcements, it can be understood that many other libraries have licensed the product. Announcements of libraries selecting WMS in recent months include:

- University of Groningen in the Netherlands, migrating from OCLC LBS (announced Dec 2015).
- West Virginia University, including related institutions totaling nine libraries, migrating from Ex Libris Voyager.
- Vrije Universiteit in Amsterdam, migrating from Infor Vubis Smart.

- Scion, a research institute in New Zealand (no migration data available).
- American University of Sharjah in the United Arab Emirates, migrating from Innovative Sierra.
- Five Canadian theological or academic institution: Carey Theological College, Regent College, St. Mark's College, and Vancouver School of Theology all migrating from Innovative Millennium; and Portage College, migrating from Symphony.
- Winthrop University in South Carolina, migrating from Innovative Sierra.
- John Cabot University in Rome, migrating from SirsiDynix Horizon.
- Four major universities in Kentucky: Eastern Kentucky University, Kentucky State University, Northern Kentucky University, and the University of Louisville, all migrating from Ex Libris Voyager.

OCLC reports that 380 libraries now have implemented WMS. Library Technology Guides lists 325 in its libraries.org database.

As a nonprofit corporation, OCLC provides detailed financial information, both in in the Form 990, filed with the IRS and required to be made available for public inspection, and in the audited financial statements it issues as part of its Annual Report to its membership. The for-profit companies in the industry do not have the same expectation to provide detailed financial information. The data compiled from the OCLC 990 forms indicates that WMS represents a growing portion of its revenue. The categories of revenue provided on the last two 990 filings include one called Management Systems, that includes WMS as well as the legacy ILS products. This category grew from about $20 million in fiscal 2011–12 to $32 million in 2013–14. End-user services, including discovery products also show growth. These filings document that metadata and resource sharing services continue as the largest categories of revenue for OCLC. Reporting these observations should not be taken as closer scrutiny of OCLC than the for-profit companies, but rather as taking advantage of available data to better understand the dynamics of its products and services and its position in the broader industry.

OCLC Expands Print Storage Services

OCLC has also recently expanded its capacity to assist libraries with the management and storage of their print collections. In January 2015, OCLC acquired Sustainable Collection Services (SCS) from its founders. Even prior to the acquisition, SCS worked closely with OCLC, making use of WorldCat and related collection analysis tools and services. Rick Lugg, Executive Director of SCS, and its other three staff members became OCLC employees at that time. Although the financial details were not mentioned at the time, the recent OCLC financial report indicates that the company was acquired for $2,172,000 with the possibility of a future payment of $1,260,000 if future performance goals are met.

SCS developed an application called GreenGlass, a web-based set of analytical tools for assessing print collections of academic libraries and to assist in making decisions regarding

Financial data Compiled from OCLC Form 990			
Income Source	**2013–14**	**2012–13**	**2011–12**
Grants	2,041,508	2,771,624	1,695,065
Metadata Services	91,680,961	92,759,493	81,556,506
Resource Sharing Services	50,533,087	46,554,421	48,534,364
Management Systems	**32,609,584**	**20,931,256**	0
End User Services	25,437,686	22,497,240	21,565,022
Digital Services	0	4,923,892	4,543,448
Other Program or service Revenue	5,229,198	13,456,738	8,839,524
Web linking and Miscellaneous	102,583	80,263	84,657
Rental Income	225,109	249,515	1,610,992
Sales of Assets	27,923,574	7,461,751	7,870,419
Sales of Inventory	0	148,356	671,253
Investment	15,161,967	6,429,342	11,137,268
Total Revenue	250,945,257	218,263,891	188,108,518

deselection or shifting to remote storage of print titles. The tools are based on an export of the bibliographic and holdings data for its print monographic collection data from its ILS which are then compared with other key resources such as WorldCat, HathiTrust, and Choice. Analysis is based on other libraries identified as peers, and what materials are available locally, regionally, or are in HathiTrust and lists of candidate titles for deselection or transfer are produced.

OCLC reports that more than 200 libraries have worked with SCS. The University of Sheffield announced in November 2015 its adoption of the SCS for assistance in managing its print collection and will be the first library outside of the UK to license the SCS GreenGlass application.

Governance

The Board of Trustees plays a key role in the governance of OCLC. This board hires the President and provides high-level oversight, auditing, and advice. The board's 14 members come primarily from leadership positions in OCLC member libraries. Board members are appointed for 2-year terms, can be reappointed, and are compensated. OCLC provides detailed information on the policies and justification for compensation of its board members and reports specific amounts on its annual IRS Form 990 tax filings. In addition to the Board of Trustees, a Global Council and multiple Regional Councils participate in the governance of OCLC.

Given their influential roles, appointments to the OCLC Board of Trustees are worth noting. OCLC announced in November 2015 that Barbra Preece, Director of the Loyola Notre Dame University library will join its Board of Trustees. A previous round of appointments effective November 2014 include Brady J. Deaton, Chancellor Emeritus, University of Missouri; Kathleen Keane, Director, Johns Hopkins University Press; John F. Szabo, City Librarian of the Los Angeles Public Library; and Ellen Tise, Senior Director, Library and Information Services, Stellenbosch University South Africa. Sandra Yee, Dean of University Libraries and School of Library and Information Science at Wayne State University serves as the chair of the OCLC Board of Trustees.

ProQuest and Ex Libris Update

The acquisition of Ex Libris by ProQuest, the most significant event in the library technology industry in recent years, has not closed as of early December 2015. Both companies continue to operate independently, though wheels are in motion for a consolidation of operations. Expect further coverage in the coming issues of *Smart Libraries Newsletter* once announcements are made concerning the finalization of the deal and details of new organizational structures or product strategies.

Momentum in the adoption of Alma and Primo continues to build. Some of the recent announcements include:

- Cantonal and University Library of Lausanne, migrating from VTLS Virtua. This library will lead the implementation of Alma in a network of more than 100 libraries in the canton of Vaud in Switzerland. The library is a member of the Library Network of Western Switzerland (RERO), one of the largest implementations of Virtua.
- The National Library of New Zealand has selected Alma and Primo to replace its current Voyager ILS. This library was a development partner and early adopter of the Ex Libris Rosetta platform for digital preservation and asset management.
- Keele University in the United Kingdom will migrate from its current Millennium ILS to Alma and Primo.
- University of Bath in the UK selected Alma and Primo to replace its existing SirsiDynix Symphony ILS. The university will also implement the new Leganto reading list product.
- Williams College in Massachusetts selected Alma and Primo to replace its Millennium ILS.
- The University of New England in Australia selected Alma and Primo to replace Virtua.
- The University of Alabama in Birmingham will migrate from Voyager to Alma and Primo and will also implement Rosetta for digital asset management and preservation.
- Austrian Library Network (OBV), which had implemented Primo in 2009, has selected Alma as the strategic resource management platform. A group of 14 institutions will participate in the initial phase of implementation, with the remaining 57 members planning to move to Alma in a subsequent phase. The network will migrate from Aleph.
- The University of Denver selected Alma and Primo to replace Sierra.
- The University of Miami will replace Millennium and Summon with Alma and Primo.
- Universidad Adolfo Ibáñez de Chile will be the first institution to implement Alma and will migrate from Aleph. The library has used Primo since 2010.
- Leiden University in the Netherlands selected Alma and Primo and will migrate from Aleph.

- The Washington State Board for Community and Technical Colleges selected Alma for as a shared platform for its 34 member institutions, replacing a variety of standalone systems.
- California State University selected Alma and Primo as a shared system for its 23 campuses, which had previously relied on separate ILS implementations.

This list of recent selections includes an impressive list that includes some very large and prominent academic and national libraries and major library systems or consortia. Libraries.org includes 491 libraries having selected Alma and shows that the majority of its adopters are large or very large academic or research libraries.

ProQuest SIPX

ProQuest has recently made a major update to its SIPX product suite to assist educational institutions with the selection and management of course materials. By leveraging existing materials in library collections and avoiding duplications, SIPX aims to provide savings on course materials. SIPX integrates with a variety of learning management systems. The product can benefit campus bookstores, copy centers, libraries, or other units involved in reading lists and course materials.

SIPX was initially developed at Stanford University and was spun off as an independent business based in Palo Alto in 2012, co-founded by Franny Lee. The products was originally named Stanford Intellectual Property Exchange, but was renamed to SIPX as it was deployed by other institutions.

ProQuest acquired SIPX in April 2015, with Franny Lee joining the company as the General Manger for the product division. ProQuest offers three product options, including SIPX Central for use throughout an institution, SIPX Camus for individual campus units, and SIPX for MOOCS for courses accessed beyond the institution. Development of SIPX has continued following the transition to ProQuest with a series of enhancements announced in November 2015. In addition to improvements in overall functionality and workflow, new capabilities have been added for integration with documents available via ProQuest subscriptions.

Following the completion of the merger, SIPX is expected to part of the portfolio of products managed by Ex Libris.

Open Source Update

Open source ILS products now constitute a routine part of the library automation industry. As much as 20 percent of the automation systems deployed in small and medium-sized public libraries are based on open source software. Percentages in the academic sector are smaller, but growing. In recent weeks, additional libraries have announced selections for two open source ILS products previously covered in *Smart Libraries Newsletter*, Koha, and Invenio.

The open source Invenio platform offered by TIND was recently selected by the United Nations Dag Hammarskjold Library. This library will use Invenio to replace its existing SirsiDynix Horizon ILS and its repository based on DSpace. The library expects to use Invenio to manage a collection of documents that will eventually approach 10 million items. TIND and the Invenio platform and its adoption by Caltech were featured in the August 2015 issue of *Smart Libraries Newsletter*. The Caltech library migrated from Millennium to Invenio hosted and supported by TIND Technologies in September 2015.

Koha continues to see many new adoptions globally. In the US, most libraries implementing Koha do so with migration, installation, support, and hosting provided through a commercial services firm. ByWater Solutions has become established as the leading Koha support provider in the US. Among the library clients, ByWater Solutions has announced are:

- Hocutt-Ellington Memorial Library of Clayton in North Carolina, withdrawing from the county-wide Polaris of the Public Library of Johnston County and Smithfield.
- Elftman Memorial Library of Salvation Army College for Officer Training at Crestmont, migrating from Library-World.
- Olivet University in California, shifting to ByWater for support from an independent implementation.
- Lantana Public Library in Florida, migrating from a Follett Athena.
- Uintah Basin Library System in Utah, a three-library system migrating from Follett Destiny and SirsiDynix Symphony.
- Lansing Community Library in Kansas, joining the Northeast Kansas Library System shared implementation, migrating from Follett Circulation Plus.
- Nine additional libraries join the Catamount Library Network in Vermont, bringing the total to 13.

ByWater Solutions issues announcements almost weekly regarding new libraries that it has engaged for its Koha support services. While each announcement may not make headlines, the cumulative impact has resulted in a substantial customer base. The libraries.org database in Library Technology Guides currently documents 625 library organizations spanning 996 libraries using Koha supported via ByWater Solutions. Its customers are mostly small or medium-sized libraries, but some of these participate in relatively large consortial implementations. In addition to providing support for Koha, ByWater Solutions is an active participant in its global community of developers.

Two of the largest systems contracting for support with ByWater Solutions are the Northeast Kansas Library System and the Plano Independent School District.

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