Smart Libraries Newsletter

News and Analysis in Library Technology Developments

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Smarter Libraries through Technology

Open Source Perspectives

By Marshall Breeding

Open source library systems continue to represent an important component of the library technology industry. This approach to software development and distribution embraces a distinct set of values and business models compared to proprietary technology products. The mandatory rules relating to how the software can be shared and modified aligns well with the collaborative values inherent to the culture of libraries. Communities that develop among the individuals and organizations involved with each open source product likewise appeal to libraries. These communities enable libraries to participate in the design and development of these software products that they rely on as vital components of their technical infrastructure. Libraries using proprietary products also engage in participatory processes to guide ongoing developments, usually through user groups.

Business Models

The business models of open source software contrast sharply with that of proprietary products. Libraries today have a savvy understanding that open source software requires significant investments, even though the use of the software itself is free from licensing fees. The characterization of open source software as free applies to its patterns of use and modification, rather than to any expectation that it does not involve direct and indirect costs. For larger-scale products, such as integrated library systems (ILSs), the costs may involve payments to commercial or non-profit organizations for hosting, support, and development services or to dedicated in-house technical personnel. In some cases, the overall costs of open source software implementations may be less than comparable proprietary products or services, though some libraries may make greater investments.

In the earlier phase of open source library systems, many libraries chose this route as much for its contrast to the offerings and practices of the proprietary vendors as for the capabilities of the software. Today, libraries rarely have the luxury of making choices on philosophical affinities but must implement technology products with proven capabilities to meet their current needs and future expectations. The ability for open source products to thrive is based on the maturity of their features and on the quality of the services available from support organizations.

Sustainability

It is essential for any product that libraries depend on for their critical operations to have a reliable foundation for ongoing development and support. In the proprietary arena, this reliability comes in the form of stable and profitable businesses that are motivated to continually maintain and improve their products to retain existing customers and attract new ones. The library technology arena has seen mixed results in the proprietary ILS sector, with many products over the years falling victim to business events, especially mergers and acquisitions. As the industry consolidated, the remaining products seem to have solid prospects with reasonable resources from each company dedicated to product development and customer support.

Open source products likewise must demonstrate sustainability. For these projects, sustainability usually takes the form of broad global communities of individuals and organizations committed to devoting resources to the ongoing development of the software. It is essential for these projects to have adequate

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financial and personnel resources and to have a competent organizational model for defining technical and functional strategies.

In the library context, open source projects that are dependent on philanthropy have not been the most successful. It is unrealistic to expect any grant-making organization to provide perpetual funding for even the most deserving software project. Even when initially seeded by grant funding, it is essential for major projects to develop a financial model where the organizations benefiting from the software contribute appropriate levels of resources. These contributions can take the form of in-kind contributions of personnel or infrastructure or through direct financial support. The open source model naturally makes it possible for some organizations to make use of the software without making such contributions, but it is essential for the health of the project to have a mix of contributors versus free riders.

Commercial self-interest also plays an important role in open source projects. Companies that profit from providing services to a software product have strong motivation to contribute to ongoing development to ensure its position in the market. If a product were to become stale or outdated, interest in services would evaporate.

In the Koha arena, for example, there are many dozens of companies globally involved in providing services. Companies such as BibLibre in France, ByWater Solutions, Catalyst IT in New Zealand, and others devote substantial resources to the development of Koha. The global Koha community, volunteers from support companies, and libraries using the software actively participate in software development, quality control, and documentation. In an environment with diverse organizations providing hosting and support services for Koha, it also becomes possible for some to become free riders, deriving income from services, but not devoting resources to improving product. While it is healthy and expected for an ecosystem of commercial providers to become established surrounding any open source product, it is important to ensure a reasonable balance of contributors.

Adoption Trends

The implementation of open source integrated library systems has grown steadily since their initial developments and deployments. Two open source products have become well established—Koha and Evergreen. In the United States, the adoption of open source ILS products began in the mid-2000s.

Koha, an integrated library system initially developed in New Zealand in 1999, has become one of the major products used internationally. Although there are no definitive statistics on the total number of Koha implementations, it is probably the ILS software used by the largest number of libraries globally. I estimate that at least 20,000 libraries may have implemented Koha. Most of these libraries are in regions with lower levels of economic resources where the absence of license fees and the availability of local expertise and ingenuity have made it a quite successful option. Throughout Latin America, India, Turkey, and the Philippines, Koha finds widespread use through both governmental initiatives and informal and commercial support arrangements.

Koha also finds substantial use in countries with more abundant financial resources. Its continuous twenty-year development path has resulted in a product on par with the proprietary products, which paired with comprehensive support services make it a strong competitor in the commercial marketplace. In the United States, ByWater Solutions, founded in 2009, has steadily grown its customer base to become the dominant provider of hosting and support services for Koha in the United States.

Evergreen, initially developed for the PINES consortium of public libraries in Georgia, has become one of the major products in the United States and Canada, with only a handful of implementations in other global regions. This ILS was developed especially for consortia of public libraries. Although some academic libraries have implemented Evergreen, it lacks the capabilities for electronic resource management, especially important for these libraries. Most of its use is concentrated in the United States through deployments in statewide consortia, which have seen a pattern of growth by adding new members as independent libraries move from standalone proprietary ILS products. Equinox Open Library Solutions, which includes individuals from the original Evergreen development team, is the largest provider of support services. Other organizations, such as the non-profit MOBIUS, also provide hosting and support services for libraries using Evergreen.

Among wealthier countries, open source ILSs are usually deployed through commercially provided services. A small number of libraries in these countries have been installed and managed internally, depending on the respective communities of developers and implementors for peer-to-peer assistance.

The rising levels of adoption of open source ILS products can be tracked through the libraries.org directory of libraries. These trends can be reliably measured in selected countries, such as the United States, Canada, and the United Kingdom, where the directory includes comprehensive representation of public and academic libraries. Current statistics show that 15 percent of public libraries in the United States have implemented either Koha or Evergreen; just over 7 percent of US academic libraries have implemented an open source

ILS. (See figures 1 and 2.) Among US public and academic libraries, the numbers of libraries opting for open source automation systems has seen a relatively gentle upward trend. In the early phase of open source ILS, enthusiasm was strong, though the actual numbers of libraries adopting these products were more modest.

Figure 1: Public libraries in the United States (open source: 15%)

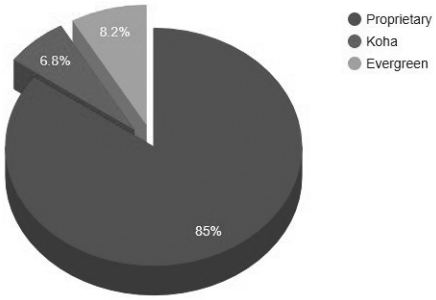
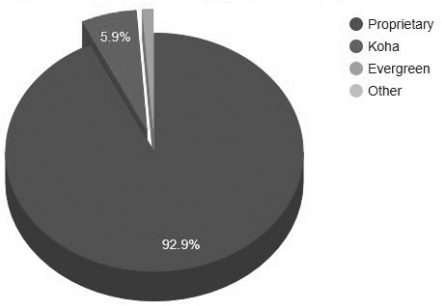


Figure 2: Academic libraries in the United States (open source: 7.1%)



Open Source Repositories Prevail

While proprietary systems continue to dominate in the ILS arena, open source options are well established. In some product categories, especially institutional repositories, open source products prevail. Academic libraries tend to rely on open source products, such as DSpace, Fedora, Samvera, and Invenio, to manage their institutional repositories with proprietary options, such as bepress, finding a smaller audience. Bepress saw some disruption when it was acquired by Elsevier in August 2017. Ex Libris has launched a new repository as a core component of Esploro, its new research services suite.

Library Services Platforms

The genre of library services platforms was established among academic libraries as a new approach for the management of their electronic and print resources. Their model of comprehensive resource management has taken hold with products including OCLC WorldShare Management Services and Ex Libris Alma. Both products were launched in about 2010 and have been deployed as global multi-tenant platforms. The last decade has seen a general shift away from legacy ILSs to one of these two products, with Ex Libris becoming established as the dominant player, especially among larger academic libraries and consortia.

The competitive environment for academic libraries has not been entirely captivated by Ex Libris and OCLC. While these two products continue to see substantial momentum, some academic libraries have interest in open source alternatives. Virginia Tech University, for example, opted to implement a suite of open source components, including Koha and Coral, as their strategic technology environment. Another cadre of libraries have joined the effort to develop FOLIO as an open source library services platform. Backed by industry giant EBSCO Information Services and Index Data as a well-regarded technology development and services firm, FOLIO has been in development since about 2016. This project has now advanced to the early implementation phase, with its first library now in production, with others apparently well on track. This issue of *Smart Libraries Newsletter* features some of the recent thresholds crossed by FOLIO. These accomplishments represent important milestones, positioning FOLIO as an interesting addition to the mix for academic libraries in an uncomfortably narrow slate of viable options. Expect future *Smart Libraries Newsletter* coverage to track whether FOLIO manages to gain a substantial portion of the market in the future.

FOLIO Crosses New Thresholds

The initiative to develop FOLIO as an open source library services platform has been underway since 2016 and has continued to cross important milestones. The software has continued to advance in its functionality and completeness, leading to its first production migration, selections in formal procurement processes, with other libraries waiting in the wings for future implementation.

The ongoing launch of the FOLIO initiative has been chronicled in previous issues of *Smart Libraries Newsletter*. Some of the distinctive characteristics of the software include

- an open source library services platform able to manage print, electronic, and digital resources;
- that it's based on a microservices architecture, including the OKAPI API gateway and Stripes user interface toolkit;
- an underlying Codex metadata model that can describe and manage multiple types of content;
- a modular design with a suite of apps that can be optionally implemented and replaced as needed without requiring wholesale changes to the overall environment;
- a multi-tenant design, though some libraries or support organizations may opt to deploy their own instances of the software;
- that it is designed to interoperate with external systems and services, within the library, institution, and external partners;
- that it is designed to integrate with any knowledgebase or discovery service;
- that the initial project concept and funding began with EBSCO Information Services;
- that Index Data contracted to create the initial technical framework and continues to contribute to ongoing development;
- that the software is owned by the Open Library Foundation, with diverse board representation including representatives from libraries invested in implementing the software and companies involved in development; and
- that the project is allied with the Open Library Environment, which previously led the Kuali OLE initiative.

In recent weeks, the FOLIO project has achieved a major benchmark with its first production use in an academic library at Chalmers University of Technology. The software has been selected through two major procurement processes, including the National Library of Hungary and the libraries of Missouri State University.

Interest in FOLIO continues to build through both the efforts of its global community and through the sales force of EBSCO Information Services, one of the major backers of the project. The project can be characterized as nearing completion of its initial product release and in the early phase of its implementation cycle. While this transition to implementation is a significant event, FOLIO remains in a nascent state with much development remaining ahead. These events help demonstrate the possibilities of the software, providing a basis for other libraries to make their own evaluations.

First Implementation of FOLIO at Chalmers University of Technology

Chalmers University of Technology in Gothenburg, Sweden has become the first library to place FOLIO into production use. It has completed the migration to FOLIO from its incumbent Sierra ILS from Innovative Interfaces. In November 2017, Chalmers signed on as an early adopter of FOLIO with hosting and support services from EBSCO Information Services. As an academic library of modest size and with a heavy emphasis on electronic resources, Chalmers University of Technology is well positioned to serve as the initial proving ground for FOLIO. The library has a reputation for innovation, serving a well-regarded institution that specializes in engineering and technology. The university has an enrollment of about 10,000 students and devotes 98 percent of its collection budget to electronic resources.

According to Marie Wenander, Head of Information Resources, the library has moved its operations from its Sierra ILS to FOLIO, including circulation and electronic resource management. Cataloging and acquisitions processing are also being phased in. Wenander reports that early experiences with FOLIO have been positive, especially with circulation, which is one of the more complete modules.

The library had previously developed its own interlibrary loan system (ILL) that it continues to use following the shift to FOLIO. Future possibilities include migrating ILL to FOLIO once that module has been completed.

Electronic resource management has also been implemented on FOLIO in conjunction with the EBSCO knowledge base. The library had previously used ProQuest Intota for managing its subscriptions to electronic resources. Wenander reported that the library migrated its journal holdings data to a temporary staging area for cleanup and is being manually transferred into the FOLIO electronic resource management (ERM) modules.

The Library of Chalmers University of Technology has been a beta test partner for the project and has contracted with EBSCO Information Services for hosting and support. The library had previously implemented EBSCO Discovery Services, which has been integrated into FOLIO for local collection holdings and for circulation status and requests.

Procurement Selections

As a new system, it is notable that FOLIO has already been selected through multiple formal procurement processes. Stated requirements almost always stipulate, or at least give preference, to products that have been successfully

implemented in institutions of similar size and complexity. Products in development must demonstrate substantial promise of fulfilling the needs of the library despite the lack of installed reference sites.

Missouri State University

The software crossed another major hurdle with its selection by the libraries of Missouri State University (MSU) in a competitive procurement process. The library selected FOLIO as the core of its new automation environment, with support and hosting to be provided by EBSCO Information Services. In addition to FOLIO, MSU will also implement EBSCO Discovery Services for article-level discovery and OpenAthens for single sign-on and remote access to electronic resources. The library had not previously implemented an index-based discovery service.

MSU libraries currently participate in the MOBIUS consortium, which provides automation services to almost all academic libraries in Missouri, based on multiple instances of Innovative's Sierra ILS. The library will break away from this shared environment, implementing FOLIO independently, with expectations to establish other channels of resource sharing. The library has an ambitious implementation schedule, with an anticipated migration expected for completion in the first half of 2020.

National Library of Hungary

In 2018, National Széchényi Library, the national library of Hungry, issued a tender for a new technology environment to replace its current Amicus system, which was implemented in 1998. Amicus is a legacy ILS that has not been updated in many years. The project, which included multiple components, was awarded to a local IT services company called HerMész-Soft. EBSCO Information Services and Index Data were named as service providers for the library's implementation of FOLIO. The library plans to implement all modules of the product. Future development will include internationalization of interfaces into Hungarian.

Pending Implementations

Lehigh University

As one of the few libraries to have placed the Kuali OLE software before the termination of the project, Lehigh University plans to continue its open source strategy as an early adopter of FOLIO. The Lehigh University Libraries plan a migration to FOLIO from Kuali OLE during the Summer of 2020, and in September 2019, the libraries announced their selection of Index Data for hosting and implementation services.

Texas A&M University

Currently operating a Voyager ILS for the libraries of its main campus, Texas A&M University plans to migrate to FOLIO, including all its modules, with a tentative timeframe of fall 2020. The library plans to host and manage its own instance of FOLIO.

Five Colleges Consortium

This consortium, which includes Amherst College, Hampshire College, Mont Holyoke College, Smith College, and the University of Massachusetts, Amherst, are working with EBSCO Information Services for hosting and support and anticipate migrating from their consortial implementation of Aleph in July 2020. The consortium will use EBSCO Discovery Service as the patron interface for FOLIO.

University of Alabama

As an early adopter site with EBSCO Information Services, the University of Alabama libraries anticipate migrating to FOLIO by fall 2020 from their incumbent Voyager ILS.

University of Chicago

The libraries of the University of Chicago implemented the Kuali OLE software for managing their physical collections in 2014. The library plans to migrate to FOLIO in July 2020 and is currently evaluating its options for hosting.

Fenway Library Organization

This consortium of academic libraries in the Boston area, which includes Emerson College, Emmanuel College, Lesley University, Episcopal Divinity School, Massachusetts College of Art, Massachusetts College of Pharmacy and Health Sciences, the Museum of Fine Arts, the New England Conservatory of Music, Wentworth Institute of Technology, and Simmons University, has been an active participant in the FOLIO community. Two of its members, the Wentworth Institute of Technology and Simmons University, have plans to migrate to FOLIO in June 2020 with support and hosting services from Index Data. The other members intend to migrate the following year.

Duke University

Duke University has been one of the major contributors to the FOLIO project and is fully committed to implementing the software. According to Tim McGeary, Associate University Librarian for Digital Strategies and Technology, the library plans to implement its ERM module in July 2020, followed by a full transition from its incumbent Aleph ILS the following year. Duke does not currently make use of an ERM system, which means that this phase of implementation will be a major

project. The library will integrate FOLIO with its current ProQuest 360 Knowledge Base and 360 Link subscriptions. Duke will integrate FOLIO into its existing discovery environment based on Blacklight.

Libraries and Consortia in Germany

The North Rhine-Westphalian Library Service Center (HBZ) and the Common Library Network (GBV) provide services to their member libraries and have both been involved in the FOLIO community. Some of the pending implementations under these groups include the State and University Library of Bremen, which is planning the implementation of the FOLIO ERM for fall 2019. Their decision on whether or not to move to all modules will be based on the results of the initial project and the maturity of the software. The University of Leipzig likewise plans implementation of FOLIO ERM in fall 2019 and a full implementation by 2022.

EBSCO Involvement

EBSCO Information Systems, which has been involved in FOLIO from its inception, continues to provide leadership and resources to the project. Although FOLIO is a strategic technology platform for EBSCO, it does not own or control the software. As a major stakeholder in the project, EBSCO has some influence, but works through a collaborative process shared among the many organizations involved in its development. The company will offer commercial hosting and support services for FOLIO and will integrate its other products and services, including EBSCO Discovery Service, OpenAthens services, and other content and technology products.

Gar Sydnor, Senior Vice President, Analytics and Hosting Services, has led EBSCO efforts related to FOLIO, which includes contributions toward its design and development and in the strengthening of its global community since April 2018. Other EBSCO personnel involved in high-profile roles with FOLIO include Neil Block (Vice President of Global Open Source Innovation), Harry Kaplanian (Senior Director for Project Management and Software Services), and Christopher Spalding (Vice President Open Source Platforms and Communities). The global sales force of the company takes an active role in promoting FOLIO.

EBSCO's business model for FOLIO stands apart from other vendors, including those involved with proprietary and open source products. As an initiative on a long-term vision of giving libraries new choices for technology, the emphasis has been on expanding its community of interest, rather than on creating immediate revenue streams.

Other Service Providers

Several other companies have also joined the commercial ecosystem surrounding FOLIO. Index Data has been involved from its earlies phase as the lead development organization for its initial framework and is now offering hosting support services to libraries interested in implementation. ByWater Solutions has also announced support FOLIO in association with hosting services from EBSCO Information Services. KnowledgeWare Technologies, based in Riyadh, Saudi Arabia, has partnered with EBSCO to provide services in support of FOLIO to libraries in the Gulf Cooperation Council and other countries in the Arab Gulf region. EBSCO has also announced a partnership with ALZAD, Inc. for FOLIO services for libraries in the Middle East and North Africa region. For libraries in Latin America, EBSCO is partnering with Infoestratégica Latina with offices in Mexico City and Bogotá.

Folio Futures

While the FOLIO initiative has crossed some very important benchmarks, it remains quite early in its product cycle. The Kuali OLE project saw a few initial deployments, though the software ultimately did not go further to become a viable product. The prospects for FOLIO, however, seem strong, at least as far as the roster of libraries currently committed to its implementation. The project benefits from substantial financial investment, diverse development resources, and an active global community of participants. Perceived success of these early implementations will naturally inform interest in other libraries that have been waiting on the sidelines. Many academic libraries continue to use legacy ILS products with less than optimal capabilities for managing their collections of electronic resources. As these libraries enter procurement processes, many will add FOLIO to the slate of considerations. With over 1,500 libraries in production and maturing capabilities, Ex Libris Alma can be considered the safe and conservative choice for libraries interested in proven solutions to manage their collections. But for libraries that value open source and are willing to adopt a product quite early in its product cycle, FOLIO is positioned to gain a portion of the academic library systems market. In addition to informal processes, the backing of EBSCO Information Services as one of major forces in the library arena has already built interest in FOLIO, which should translate into increasing the number of future implementations.

FOLIO Chronology

- June 2016: Initial public announcement for the FOLIO project
- June 2018: EBSCO Information Services is selected to provide hosting and services for the University of Alabama implementation of FOLIO
- March 2019: Index Data is selected for services for FOLIO support for Wentworth Institute of Technology and Simmons University and other Fenway Library Organization members
- October 2019: Lehigh University announces selection of Index Data for hosting and services for FOLIO, with implementation planned for 2020
- October 2019: Missouri State University announces selection of FOLIO supported by EBSCO Information Services
- October 2019: Chalmers University of Technology places FOLIO into production with hosting and support from EBSCO Information Services

Smart Libraries Q&A

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

The library's ISP won't provide a means for us to change the Wi-Fi password or provide usage statistics without doing it themselves and charging more than we can afford for the service. We cannot change ISPs. I was thinking about buying a new router and installing it so that I could control these functions. Neither the library nor the county has an IT department or even an IT person. Do you have any recommendations?

Providing free and reliable Wi-Fi for library patrons has become an expected service for public and academic libraries. Most libraries configure their wireless network to be available through an appropriately named SSID, usually the name of the library, and configure the network to present an informational page with any needed terms or conditions that must be acknowledged before enabling users to connect. It is also essential to control whether communications will be encrypted and whether any passwords are needed to connect. Libraries also need to be able to document the use of the service, usually through the number of sessions or bandwidth provided.

Implementing a Wi-Fi network without the ability to configure and control how it is delivered to the public can be quite a problem for a library. The question mentions that the internet service provider (ISP) does not configure the service according to the library's needs or will charge an excessive fee for making these changes. Most business and residential internet service offerings include user-friendly tools for configuration. For the case in question, further discussions with the provider would be needed to learn more about the obstacles to implement the configuration details needed. Are there technical obstacles that prevent the library from implementing its unique configuration settings, or do business policies and pricing prevent making these changes?

It is possible that having the library purchasing its own router would address this issue, depending on the level of control the library has on its network infrastructure. In most cases, the ISP would need to be involved in much more complex configuration issues to activate a customer-provided router compared to making routine configurations to the existing equipment. That said, if the library has general control over its local area network, it could install and configure its own Wi-Fi router without intervention. The library would need to understand some of the details of its network infrastructure and how to securely implement the needed Wi-Fi hotspots or routers. Naturally, the cost of purchasing a new enterprise-quality router or hotspots for the library would need to be compared to the service fee the ISP plans to charge for custom configurations. Although inexpensive residential equipment might be tempting, these devices may not have the features and capacity needed for a high-use public-use library Wi-Fi service.

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