



Smart Libraries™

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Smarter Libraries through Technology: Five Years of Library Services Platforms

By Marshall Breeding

We are now five years into the deployment of the genre of library services platforms. This breed of software, implemented primarily in academic and other types of research libraries, departs from the model of the integrated library system (ILS) in several critical areas. Although the conceptual and technical development of this new type of library software was in the works for a few years, its deployment in libraries began in 2011. At this five-year benchmark it is of interest to review the current landscape of these products, assess the level of adoption, and note any discernable trends.

I initially introduced the term “Library Services Platform” in this publication for its August 2011 issue, and it has been adopted fairly broadly in reference to this category of products. The following excerpt describes the rationale for proposing this term rather than continuing to consider these products within the existing category of ILSs:

It is clear that the connotation of the term “integrated library system” fails

to capture the essence of this new generation of products, as does the term “library management system,” though it is used in other parts of the English-speaking world. While the new genre entrants are indeed integrated—even more so than those of the past generation—the term ILS has become synonymous with the print-oriented products. We see that OCLC and Serials Solutions have both latched onto the term “Web-scale.” Ex Libris tags their product “unified resource management.” One might be tempted to use a term such as “next-generation integrated system,” but such a designation comes with a short shelf life, especially for long-overdue revitalizations.

I’m gravitating toward the term “library services platform” for this new software genre. The products are library-specific, they enable the library to perform its services, internally and externally though their built-in functionality, as well as exposing a platform of Web services and other APIs for interoperability and custom development. In a time when long-standing terms like “integrated library system,” or OPAC bring along considerable negative baggage, we need new terms when we talk about what comes next. In the same way that discovery services has become a fairly well accepted genre for the patron interfaces that replaced online catalogs, I posit something like library services platform for the genre of software that replaces the legacy of integrated library systems.¹

This issue of *Smart Libraries Newsletter* gives an overview of the progress of the genre of library services platforms. We review the basic functional

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and technical characteristics that have coalesced in these products and report on the level of acceptance these products have received in the field. These products have sparked a major transition in technology infrastructure for academic libraries and warrant our ongoing attention.

Reference

1. Marshall Breeding, "The Beginning of the End of the ILS in Academic Libraries," *Smart Libraries Newsletter* XXXI, no. 8 (2011): 2–3.

A Progress Report on Library Services Platforms

Definition and Characteristics

Although each of the products offers its distinct approach to functionality and technology infrastructure, there are a set of products that have diverged significantly from the well-established category of ILSs. Many of these characteristics arise out of the current technology paradigm centered on services deployed entirely through the Web, oriented to collaboration and social interactions, and powered by massive data stores.

Library services platforms are a type of "resource management system." These products are used by the personnel of a library or related organization to perform functions related to the acquisition and description of collections, fulfillment of materials to users, and other operational tasks. Some may include or be packaged with an online catalog or discovery tool designed for patrons. Types of resource management systems include ILSs, library services platforms, electronic resource management systems, archival management systems, or other specialized tools.

Discovery products, though related, fall into another category. Index-based discovery services, such as EBSCO Discovery Service, Primo with Primo Central, Summon, and WorldCat Discovery Service, come powered with an index populated with article-level metadata or full text from the scholarly and professional literature. Discovery interfaces provide an alternative way of searching a library's online catalog and other resources, usually based on relevancy-based retrieval, faceted navigation, and other tools to facilitate search, improve user experience, or explore library collections. Open source discovery interfaces include Blacklight and VuFind; proprietary discovery interfaces include Sirsi-Dynix Enterprise, Innovative's Encore, and LS2 PAC from The Library Corporation. Discovery interfaces may be tied to a particular vendor's products or may be configurable to work with a broad range of resource management systems.

The genre of library services platforms includes products with distinctive characteristics in their approach to functionality and in their technical architecture. These characteristics include:

- **Web-based interfaces.** All functionality can be accessed via a Web browser without the need for locally installed software for staff members using the system. The interface should function without additional software layers.
- **Deployed via software as a service.** The implementation of the product should be accomplished without installing local server software or hardware.
- **Multi-tenant platform.** All users of the service share the same instance or code base. All organizations use the same version of the service. Multi-tenant architecture aggregates and segregates data and functionality appropriately for each consortium or library that uses the product. Financial, user, and other data held privately by each organization cannot be accessed by other organizations. In most cases there will be a single global instance of the software, although there may also be additional instances for special circumstances.
- **Shared data components.** These library services platforms include built-in knowledge bases and other shared content components that can be used by all users of the service to avoid replicating common data elements. A library services package will generally provide access to a knowledge base of e-content resources that details and organizes the items available within aggregated databases and other content products.
- **Consolidated resource management.** Rather than offering separate interfaces for managing media of different types, library services platforms follow a more unified approach, branching workflows as needed to accommodate any different processing tasks relevant for print, electronic, or digital resources.

- **Extensible and Interoperable.** These library services platforms provide a complete set of application programming interfaces (APIs) to enable third-party tools to programmatically access the data and functionality of the platform. These APIs can be used by library programmers to create new services or units of functionality, to exchange data with administrative systems, learning management platforms, or any other relevant application within its technical environment or with its business partners and providers.

Products and Projects

Only a limited number of products have been developed that embody the characteristics of the services platforms model. This limited number of products is not surprising given the massive consolidation of the industry, where both the number of technology providers and products continues to narrow. For the organizations offering library services platforms, these products are meant to displace multiple incumbent products in their long-term business strategies. Library services platforms are a very complex type of business software requiring large-scale development capacity and a multi-year effort for an initial version, followed by continuous ongoing enhancements. The current products within the genre were developed entirely anew, apart from any existing resource management product. Not all attempts at developing these products have been successful.

Product	Sales by year					Cumulative installations
	2015	2014	2013	2012	2011	
Alma	88	43	31	17	24	626
Sierra	90	123	113	117	206	582
WorldShare Management Services	68	79	92	163	184	386

Alma embraces the full set of qualities in the library services model. It is based on a globally deployed multi-tenant platform; all functionality is provided through Web-based interfaces; it includes a built-in knowledge base of e-resource holdings as well as a community catalog of millions of bibliographic records; and it exposes APIs for interoperability and extensibility. Ex Libris reported in June 2016 that over 1 million transactions are conducted through Alma APIs daily.

Alma has been especially successful for larger implementations in consortia and large library systems. Some of the organizations that have selected Alma include:

- BIBSYS: 105 libraries in Norway, including the National Library, major university libraries, and special research

In addition to the products that embrace all aspects of the library services platforms model, others can be considered as partial or hybrid implementations. The ILSs based on the client/server architecture can be expected to evolve to increasingly incorporate aspects of the technology architecture and workflow patterns seen in library services platforms. Some organizations may position their products as library services platforms even before they fully adhere to the principal characteristics of the genre.

Ex Libris Alma

Ex Libris began the conceptual exploration of what it termed its Unified Resource Management framework in May 2009 and began working with a group of development partner libraries that July. The product brand of Alma was announced in January 2011. The first production implementation of Alma took place in July 2012 at the Thomas P. O'Neill, Jr. Library of Boston College.

Prior to the production launch of Alma, Ex Libris made a number of sales to libraries interested in early adoption. 24 libraries signed agreements for Alma prior to its availability as a production service. As shown below in Table 1, Alma's sales have increased aggressively each year since 2012, while the number of commitments to WorldShare Management Services and Sierra has slowed during that period.

libraries, selected Alma in January 2014.

- The California State University System selected Alma in June 2015 as a shared environment for its 23 campuses.
- Connecticut State Colleges and Universities selected Alma for its 18 member institutions in 2015.
- Consortium of Academic and Special Libraries of Saskatchewan, including the University of Regina, Saskatchewan Polytechnic, and a variety of other research and special libraries in the province, announced its selection of Alma in May 2016.
- Detroit Area Library Network, led by Wayne State University and including other academic, medical, and special libraries in the Detroit area, selected Alma in February 2016.

- The University System of Georgia selected Alma for a site-wide shared automation environment for all 31 member institutions for all Georgia public universities and colleges.
- Joint University Library Advisory Committee, representing the public universities in Hong Kong, selected Alma.
- Keystone Library Network of 18 academic and research libraries in Pennsylvania selected Alma in April 2016.
- Treasure State Academic Information and Library Services, a consortium including 16 academic and research libraries in Montana selected Alma.
- Orbis Cascade Alliance, a consortium of 37 academic and research libraries in Washington, Oregon, and Idaho announced its selection of Alma for shared automation infrastructure in October 2012 and completed its implementation in January 2015.
- UNILINK, a consortium of academic and other research libraries in Australia, selected Alma in 2010, with its member libraries individually opting to implement.
- University System of Georgia Libraries selected Alma.
- Wales Higher Education Forum, representing all 10 of the major academic libraries, selected Alma in December 2014.
- Washington Idaho Network, including mid-sized academic institutions in Washington and Idaho, selected Alma in 2014.
- Washington Research Library Consortium, including major university libraries in the Washington, DC area, announced its selection of Alma in June 2016, with implementation scheduled to be completed in 2018.
- Washington State Board for Community and Technical Colleges selected Alma for its 35 member institutions in July 2015.
- The University of Wisconsin system selected Alma in January 2014 for its 26 member institutions and is now in production.
- The University of Cambridge, including about 100 individual libraries with combined collections exceeding 8 million volumes, announced its selection of Alma in April 2016.

Alma has been selected exclusively by academic and research libraries. Any use of Alma by public libraries has been incidental, such as when a large network of mostly academic or research libraries may include a small number of public libraries. Libraries implementing Alma tend to be large and complex organizations.

[OCLC WorldShare Management Services](#)

OCLC announced in Spring 2009 that it would be developing a new resource management platform, which it later branded as WorldShare Management Services (WMS). The concepts

of the design were informed by advisory groups engaged from that period. WMS follows all aspects of the library services platform model. The service is deployed through a global multi-tenant platform; all functionality is accessed through Web-based interfaces; a knowledge base of e-resource holdings is built-in; its bibliographic services are based on OCLC's massive WorldCat database; and the platform exposes APIs for extensibility and interoperability.

Following two years of development, early versions of the service were placed into production in the Craven-Pamlico-Carteret Regional Library System and High Point University in 2011.

Since its launch, OCLC has seen a strong response from libraries in licensing WMS. Since 2011 the number of libraries making commitments to WMS has diminished each year, but the size of organizations involved has been growing. OCLC announced in June 2016 that over 500 libraries have selected WMS, spanning five continents.

Libraries of all sizes and organizational configurations have selected WMS. While most implementations have been for individual libraries, OCLC also offers functionality for groups of libraries interested in sharing an implementation. Some of the consortia that have selected WMS include:

- LIBROS Consortium, which consists of the 16 academic libraries in New Mexico, including the University of New Mexico, selected WMS in January 2014 and placed it into production in March 2015.
- HELIN library consortium in Rhode Island, including 8 academic and 8 special libraries, selected WMS in 2016.
- Private Academic Library Network in Indiana (PALNI) selected WMS in January 2014 for its 23 members, primarily small college and seminary libraries.

WMS has to date been selected primarily by academic libraries (70%), although public (5.8%) and school libraries (3.3%) are represented in smaller proportions. While libraries of all sizes have implemented WorldShare Management Services, the majority are mid-sized libraries.

[Kuali OLE](#)

The progress of the Kuali OLE initiative to create an open-source resource management system for academic and research libraries has been thoroughly chronicled in *Smart Libraries Newsletter*, beginning with its initial planning phase in 2008 through the recent announcements in June 2016 that the software would not be completed as planned, but that the organization would instead focus its efforts on promoting engagement with the FOLIO: The Future of Libraries is Open project.

Kuali OLE was conceived with characteristics mostly consistent with the model of a library services platform. It was designed to manage both print and electronic resources through unified workflows. The initial development focused on management of print collections, with support for electronic resources planned for subsequent releases, including integration with the Global Open Knowledgebase. The versions implemented in production for the University of Chicago, Lehigh University, and the SOAS library in the United Kingdom did not include electronic resource management. The Kuali OLE software was also not designed as a multi-tenant but was more oriented to institutional deployments.

While the Open Library Environment continues as an initiative to promote open source software in libraries of higher educational institutions, primarily through the FOLIO initiative, the Kuali OLE software cannot be considered an active option in the genre of library services platforms.

ProQuest Intota

Intota was conceived by ProQuest as a library services platform, embodying all the functional and technical characteristics. The company's intention to develop the platform was announced in June 2011 by its Serials Solution business unit. Intota Assessment, a business analytics service based on the concepts and technical infrastructure that was planned for the full Intota library services platform, was released in November 2013. ProQuest also offered a package called Intota v.1 that included Summon, Intota Assessment, and its 360 suite of applications for electronic resource management. Subsequent versions were planned to deliver the full functionality of comprehensive resource management.

The acquisition of Ex Libris by ProQuest spelled the demise of Intota as a complete library services platform. Rather than completing the development of Intota, Alma now stands as the strategic library services platform for ProQuest. Intota Analytics, Summon, and the 360 suite of tools will continue to be enhanced and supported. As a result of this sequence of events, Intota cannot be considered as an active member of the genre of library services platforms.

Sierra from Innovative Interfaces

Innovative launched Sierra as its latest resource management platform in April 2011. The company has followed an evolutionary development strategy since its inception, releasing a new product about once a decade that takes forward features and functionality delivered through new technical underpinnings. Innopac was based on text interfaces addressing software residing on a mid-range mainframe computer. Millennium was based on modules deployed via graphical Java

software following the client/server architecture. Sierra was released with a unified client spanning all modules delivered through a unified Java-based staff client. The technical infrastructure for Sierra was re-engineered to embody more of a services-oriented architecture, and its database structures were implemented in PostgreSQL, an open source database management system. This approach enabled Innovative to accelerate the development of Sierra as a resource management system following a more modern technical architecture with all of the rich functionality that had been present in its previous products.

Sierra was not created according to some of the characteristics of a library services platform. It does not rely on Web-based interfaces for functionality, but rather is deployed through graphical clients based on the Java Run-time Environment that must be installed on the computers used at service desks and by staff members. Innovative is currently developing Web interfaces for both Sierra and Polaris, based on the LEAP technology initially created by Polaris before it was acquired. Sierra is also oriented to institutional deployments on servers rather than as a global multi-tenant platform. Innovative has recently announced that it is developing a new knowledge base, but Sierra to date has not included comprehensive e-resource knowledge bases.

Innovative has been quite successful in terms of the numbers of libraries licensing Sierra. Innovative has historically worked with large numbers of consortia. Many of those that have previously relied on Millennium have shifted to Sierra. Others have moved from competing systems. These include:

- Florida Academic Libraries Services Consortium, including all 40 of the public universities and community colleges in the state, previously had separate shared implementations of Ex Libris Aleph and are planning to move to a single shared implementation of Sierra and Encore Duet, which includes access to EBSCO Discovery Service.
- Traverse des Sioux Library System of public libraries in Minnesota is migrating from SirsiDynix Symphony.
- Black County Consortium in the United Kingdom is migrating from Capita Alto.
- Ireland Library Services are performing a nation-wide implementation of Sierra with libraries migrating from a variety of incumbent systems, especially OpenGalaxy from Axiell.
- Library Connection, a consortium of 27 public and academic libraries in Connecticut, is migrating from SirsiDynix Symphony.
- PrairieCat, a regional network of 155 public, school, and special libraries in Illinois, is migrating from SirsiDynix Symphony.

- WISPALS, a consortium of college and technical school libraries in Wisconsin, is migrating from Ex Libris Voyager.

Out of the 125 members of the Association of Research Libraries (ARL), 16 have implemented Sierra. All but the two ARL members associated with the state-wide Sierra implementation underway in Florida migrated from Millennium. Another 17 ARL members continue on Millennium.

According to those registrations in libraries.org, public libraries represent 64.4 percent of libraries using Sierra, while 27.2 percent are academic libraries. Of the libraries remaining on Millennium, 49.4 percent are academic and 27.2 percent are public.

Although innovative positions Sierra as a library services platform, it is a partial implementation relative to the characteristics defined above. Sierra carries forward characteristics of the ILS as it increasingly embodies qualities of a library services platform. The strong sales performance of Sierra indicates ongoing interest in products that do not strictly adhere to the library services model.

SirsiDynix BLUEcloud

SirsiDynix has followed a hybrid approach in its product development strategy. The company has two strategic ILSs: Symphony and Horizon. Both of these continue to be supported and enhanced, though SirsiDynix focuses its attention on Symphony for new sales. Symphony and Horizon generally follow a client/server architecture, with Java-based graphical clients used by staff members and for service desks. The server architecture is designed for institutional deployments, though a very high portion is hosted by SirsiDynix.

Complementing its Symphony and Horizon ILS products, SirsiDynix has developed a new multi-tenant platform, branded as BLUEcloud. This platform provides functionality and services through Web-based interfaces, though reliant on a Symphony or Horizon ILS installation. A layer of Web services has been created to facilitate communications between the Symphony or Horizon and BLUEcloud. The APIs exposed in Web services can also be used by the library and other third parties for interoperability with other applications. SirsiDynix is creating BLUEcloud modules to replace existing areas of functionality otherwise delivered through their graphical clients, such as cataloging, circulation, and acquisitions. Though deployed through the multi-tenant BLUEcloud platform, these modules connect to the library's Horizon or Symphony server. Other BLUEcloud modules address new areas of functionality, such as

eResource Central for management and access of e-books and other electronic resources.

Since BLUEcloud supplements a Symphony or Horizon ILS, its sales are not tracked the same way as complete library services platforms such as Alma or WMS. SirsiDynix reports significant uptake among its existing customers for the BLUEcloud products, and new sales of Symphony also usually include at least some BLUEcloud modules.

The hybrid model of using BLUEcloud with Symphony or Horizon means that libraries do not have to perform any migration to take advantage of new Web-based interfaces and functionality. While data and some layers of functionality remain resident on the legacy ILS platforms, libraries are able to move into a more modern realm of technology without the effort of a system migration.

This strategy has seen positive results for SirsiDynix in strengthening its retention of existing clients in all types of libraries and in new sales, mostly in public libraries. Most of the sales of Symphony to academic libraries in the United States in recent years have been add-ons to existing networks or to smaller libraries; SirsiDynix has seen more success with Symphony in academic libraries in Latin America, Asia, and other international regions.

Folio: New Open Source Initiative

The May 2016 issue of *Smart Libraries Newsletter* provided extensive coverage of the new initiative to create a new open source library services platform. This project is now underway with technical development being performed by Index Data as well as through a community of participants in libraries and other companies and with financial backing of EBSCO Information Services. That initiative has since been named FOLIO: The Future of Libraries is Open. Although not formally announced until the ALA Annual Conference in June 2016, work has been underway since mid 2015.

This initiative will build a new library services platform and will not be based on the software produced by the Quali OLE project, or any of the open source ILS products. Key principles of the design of FOLIO include a lightweight services framework, plug-in modules that can be developed independently, and independence from any specific discovery service rather than the packaged approach seen with Ex Libris and OCLC. At least initially, FOLIO will be designed specifically for academic and research libraries.

At this phase, it is much too early to gauge the impact of FOLIO on the overall market. But with the financial backing of EBSCO, which is also promoting it via a variety of venues, it has gathered significant attention in a short time.

Quria

Another newcomer to the library services genre, Quria will be created by Axiell for public libraries. The June 2016 issue of *Smart Libraries Newsletter* featured this new development effort by a library technology vendor that has little presence with its library products in the United States. Quria will fully embody the model of the library services platform, including a multi-tenant, Web-native platform and a functional design that gives primacy to digital content while still providing support to print collections. Axiell will initially promote Quria in France and Norway, even before Scandinavia and the United Kingdom where its existing library products are widely implemented.

The technical characteristics of Quria resemble that of FOLIO. It is based on the microservices architecture, with a lightweight services layer supporting interchangeable functional modules.

In this early stage of development, it is not yet possible to estimate its potential impact. As the first library services platform oriented to public libraries, it warrants attention, testing the waters of whether these types of libraries, which have until now remained mostly within the realm of evolved client/server systems, are ready to embrace alternatives created using cloud technologies.

Observations and Trends

Library Services Platforms stand as the dominant choice for academic libraries. After five years in the field, preceded by three years of conceptual and technical development, products such as Alma and WMS have become the top two competitors for academic libraries seeking new systems. These products take a significantly different tack to library automation than ILSs. In addition to deployment through Web-native platforms, these products are designed around the reality that academic libraries invest most of their budgets on electronic resources and provide tools that aim to streamline their management.

The library services platform can be seen as the preferred approach for academic libraries seeking new automation systems. Alma and WMS have both seen considerable success among academic libraries with larger libraries and consortia tipping toward Alma, and WMS attracting many mid-sized institutions.

Ex Libris leads the pack with Alma, though WMS provides strong competition. Ex Libris has so far outpaced OCLC in terms of contracts signed, a lead that widens more

dramatically when factoring in the number and size of libraries involved.

The members of the ARL can be taken as a barometer of the largest academic libraries. To date, 28 of its members have selected Alma and 3 have selected WMS. This combined figure of 31 out of 125 total members indicates that while library services platforms have made major inroads among this class of libraries, the majority remains on more traditional ILS products.

These trends cannot be taken as absolute. Innovative has made some impressive gains among academic libraries with Sierra, including the massive state-wide project of academic and college libraries in Florida and a shared environment for the academic libraries in Catalonia. These selections indicate that some libraries may prefer a product that offers aspects of both a library services platform and an ILS. SirsiDynix continues to retain many of its academic library customers, even when they go out for competitive procurement, and has won new academic libraries, especially on the international front.

The genre has had some casualties. Despite multi-year development efforts ProQuest Intota and Quali OLE were eventually withdrawn as active projects. Library services platforms are complex business applications requiring large investments in development resources.

Two fresh projects have launched in recent months—FOLIO for academic libraries and Quria for public libraries. Both posit a more lightweight approach with replaceable modules, compared to the more tightly integrated platforms seen in Alma and WorldShare Management Services.

Product cycles for strategic library products play out over very long time periods. Voyager, for example, was launched in 1996 and continued to see strong sales through about 2006. After which the number of new sales declined rapidly, but with support and at least some level of enhancement continuing through present day, it has a lifespan of over two decades. Now at a five-year mark, library services platforms can be considered as a well-established genre, and one gaining momentum. It seems reasonable to project that over the next five years that the proportions of academic libraries moving to this type of product will continue to increase.

The current slate of library services platforms includes a very narrow group of competitors. The recent dynamics of a new open source alternative may be welcomed by some libraries. Likewise, it will be interesting to see whether Axiell's Quria will be successful in cultivating a library services platform in the public library sphere.



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