



Smart Libraries™

Formerly Library Systems Newsletter™

50 East Huron Street, Chicago, Illinois 60611-2795, USA



Smarter Libraries through Technology: Technologies for Deep Collaboration

By Marshall Breeding

Libraries today face the reality that they must serve their communities with a level of resources far from ideal. In most libraries I encounter, collection budgets and personnel resources are stretched far beyond comfortable bounds. Libraries appreciate any technology with the potential to enable more efficient operations and the best use of their collections and personnel.

Even the most affluent libraries cannot afford to acquire all of the materials in a given field. Libraries must be strategic in acquisitions to build their collections. In the absence of comprehensive collections acquired in advance, libraries have developed channels through which they can expedite purchasing materials based on patron requests or borrowing materials from peer institutions. Libraries often band together in consortia to provide patrons access to the combined collections of the participants. Increasingly libraries in consortia expect technologies that enable unmediated requests for materials by patrons of their partner libraries and automate the management

and tracking of the materials. Without adequate technology support, high volumes of interlibrary lending can be cumbersome for library personnel and too slow for patrons.

Efficient, direct consortial borrowing and fulfillment systems provide the means for groups of libraries to share their resources, providing a larger pool of materials for patrons associated with any of the members. To participate in this type of arrangement, libraries do not necessarily need to alter the types of materials they collect or the way they manage them internally.

Libraries increasingly are interested in deeper levels of collaboration. Increasing the size of the aggregate collection does not necessarily provide significant savings in how the individual libraries acquire their collections. A more advanced stage of collaborative collection development enables libraries to work together to identify areas of collection strength for each library to focus their resources. Libraries can then spend fewer resources in materials related other disciplines. This strategy distributed collection strength among partner institutions must be supported by systems to enable patrons' discovery of materials located in a remote library, user-friendly request features, and other tools to efficiently fulfill these requests. Most importantly, delivery must be rapid.

Collaborative collection development also requires optimized systems for acquiring materials. It is difficult for selectors to acquire materials in the context of a consortial collection if many separate systems have to be checked. As individual libraries make selection decisions on which materials to purchase, it is essential for them to have a system-wide view of the aggregate collection. Focused collection-building in

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coordination with consortium partners promises collaborative collections with deeper coverage across more disciplines. Naturally, each institution will have to create core working collections in many major disciplines so that routine materials can be accessed from the local collection without the time and overhead involved in borrowing from partners. When libraries engage in collaborative collections, they benefit from systems that provide adequate use analytics to determine what items need to be held locally and which ones can be provided through consortial borrowing.

Collaborating in cataloging of materials also offers opportunities for savings and efficiencies. Most libraries have streamlined processes for routine materials, allowing their most skilled catalogers to focus on specialized materials. These materials are often in diverse languages and scripts. One obvious collaboration would be partners' identifying and supplying expert catalogers in their specified areas of specialization and channeling materials accordingly. Such a collaborative cataloging strategy means that librarians would often describe materials not acquired for library.

Libraries can choose among several models to achieve resource sharing, each supported by different types of technical infrastructure. Libraries can opt to function self-sufficiently, relying on mostly on their own collections and operating their own integrated library system. These libraries can rely on external interlibrary loan services, such as that from OCLC, to supply materials to patrons not held in the local collection. Libraries can also form consortia where each member operates its own integrated library system, but supplemented with an additional layer of infrastructure to manage the lending of materials across the consortium. These direct consortium borrowing systems offer considerable cost savings and more rapid fulfillment of materials compared to external interlibrary loan services. An even deeper collaboration

is participation in shared automation infrastructure. This model of resource sharing isn't necessarily new, but has seen increased adoption among groups of libraries that have previously operated separate integrated library systems. The new genre of library services platforms has sparked increased interest in shared implementations.

This issue of *Smart Libraries Newsletter* includes coverage of consortial interlibrary borrowing systems. SHAREit from Auto-Graphics ranks as one of the major products in this niche and has seen some recent new developments and new implementations. We also note a new project that will be the first one to make use of the open source Fulfillment product. This is a challenging product sector with a very limited number of opportunities for new sales. The number of implementations is small in number, but each implementation can be very complex, primarily due to the interoperability that must be established and maintained with diverse ILS products.

Both the shared infrastructure and the consortial borrowing systems will remain as viable options for resource sharing. In recent years we have seen interest surge in the direction of shared infrastructure, both in the United States and internationally. National and statewide initiatives to replace many independent integrated library systems with a single platform are under consideration, are in the procurement phase, or have been completed. It will be very interesting to see if these shared platforms live up to expectations in a longer time frame. The success of these early implementations will drive the extent to which this approach becomes the dominant model for library automation in the coming years. But regardless of the implementation model or technology platform involved, the time of isolation and self-sufficiency is waning. I anticipate that the next phase of library technology will be based on ever deeper levels of cooperation not only to achieve savings and efficiency, but to increase the impact and levels of service.

Auto-Graphics Extends Interoperability for SHAREit

Auto-Graphics specializes in library automation and resource sharing technologies, primarily within the public library sector. Its VERSO integrated library system has been implemented in some 500 small to mid-sized public libraries, mostly in the United States. Auto-Graphics has worked to extend the adoption of VERSO beyond the smaller library niche into midsized, multibranch public libraries. The recent selection of VERSO by the LaPorte Country Public Library in Indiana

with seven branches serving a population of 65,000 reflects progress in attracting larger libraries.

The company has also developed a consortial interlibrary borrowing system branded as SHAREit that provides mediated or unmediated loan requests for patrons associated with participating libraries. While VERSO has found its niche among smaller libraries, many of the company's resource-sharing implementations serve large consortia, including some statewide initiatives.

Its SEARCHit product provides federated search across multiple content targets, which can include licensed electronic databases, library catalogs, or other resources. Auto-Graphics also offers a bibliographic service called MARCIt that provide access to 30 million bibliographic records.

Consortial Interlibrary Borrowing Systems

Consortial interlibrary borrowing systems assume that the participating libraries will continue to use their existing integrated library systems for collection management and circulation within their own system. Consortial borrowing supplements the existing ILS to provide an additional service to enable patrons to request items for items not held by their local library.

This model of consortial resource sharing assumes that the libraries will continue to use their existing integrated library systems. An alternative approach accomplishes resource sharing through the implementation of a shared integrated library system. The shared infrastructure approach takes advantage of the requesting and routing functions inherent in the circulation module of most major ILS products.

Consortial interlibrary borrowing systems manage a set of complex processes to enable libraries to share resources among participating institutions. These products include multiple components and work in conjunction with the integrated library systems used by the libraries. A discovery layer, or union catalog, enables patrons to search across the entire body of materials available to them through the consortium. The system also needs to manage a variety of transactions, beginning with the initial request from a patron for an item held by another library, the transmission of the request to the library potentially able to supply the item, messaging to library personnel to pull and the item, track the item in transit, and record its arrival in the home library or designated pick-up location to the patron. Once returned by the patron, another set of transactions manage its transit and receipt by the owning library. A resource sharing application includes the business logic, notice or messaging delivery components, and a complex set of communications interactions.

A Narrow Market Sector

The genre of resource sharing technologies has only a very small number of products available, including:

- SHAREit from Auto-Graphics.
- RelaisD2D from Relais International.

- INN-Reach from Innovative Interfaces.
- WorldShare Interlibrary Loan from OCLC.

A widely used resource sharing product, URSA, was discontinued in 2011. Developed by CPS Systems in Australia and acquired by Ameritech Library Systems in 1999, URSA became part of SirsiDynix in 2005.

OCLC provides a variety of resource sharing products and services. Its WorldShare Interlibrary Loan service finds use globally, especially by academic, national, special, and large public libraries. Library organizations that rely on peer-to-peer resource sharing among their members will use WorldShare Interlibrary Loan to satisfy requests for materials not available internally. In addition to this core service, OCLC has been involved with other resource sharing products. Its Navigator service, for example, is based on the VDX technology acquired with Fretwell-Downing. While these products continue to see use in existing implementations, OCLC focuses its current attention on developing and promoting products based on its WorldShare and WorldCat platforms.

SHAREit: Resource Sharing for State-wide Initiatives and Consortia

Auto-Graphics has a long track record in providing resource sharing and interlibrary loan technologies.

SHAREit can provide a union catalog representing the holdings of the participating libraries through either a virtual catalog based on dynamic Z39.50 searches or a physical catalog that aggregates bibliographic records and holdings. It can also operate in a hybrid model where some participants contribute records to the central union catalog database, and others participate through Z39.50 search.

A number of consortia and state-wide projects rely on SHAREit for resource sharing, including:

- State Library of Kansas, for a statewide resource sharing system. Renewed in December 2014.
- State Library of Pennsylvania, where it supports a service called Access PA, providing a union catalog representing the holdings of over 2,600 public, school, and academic libraries throughout the state. This implementation combines a physical union database and a virtual catalog of more than 100 Z39.50 targets into a hybrid system that also features the company's new CLUSTERit discovery interface. CLUSTERit groups similar items together in result displays even when they come from different sources.

- State Library of Louisiana, providing a union catalog and interlibrary loan for all the public parish libraries in the state.
- Mississippi Library Commission, for a virtual catalog including the public libraries and community colleges in the state.
- Massachusetts Virtual Catalog, proving a virtual union catalog of all the public libraries and most of the public academic libraries. MVC relies on NCIP to interact with the ILS implementations of participating libraries, supporting all of the major products.
- Tennessee State Library and Archives, providing a physical union catalog of all the public libraries in the state. Auto-Graphics has also been selected to provide its VERSO ILS to most of the public libraries in the state, except those serving large urban areas. More than 100 public libraries in Tennessee have implemented VERSO. The company's CILL (Circulation to ILL) module provides an integrated interlibrary loan request capability for those libraries using VERSO.
- Wisconsin Department of Public Instruction, for a state-wide system including public, academic, school and special libraries; with a hybrid virtual and physical union catalog, using both NCIP and ISO ILL.
- The New Jersey State Library, providing geolocation authentication and federated search access to more than 50 licensed electronic resources using SEARCHit.

This scenario illustrates the rising use of Application Programming Interfaces (APIs) to address interoperability among library systems, even in cases that may have been previously addressed by formal standard protocols.

The number of interlibrary loan products is narrow, including INN-Reach from Innovative Interfaces, RelaisD2D from Relais International, and SHAREit from Auto-Graphics.

Interoperability with Integrated Library Systems

These products perform much of their functionality through sending transactions in and out of the integrated library systems used by each of the libraries that participate in the consortium. The ability for a resource sharing system to function depends on the whether the ILS products used within the consortium support the standard protocols, such as SIP2, NCIP, Z39.50, and ISO ILL. Although most of the major ILS products provide some degree of support for the standard protocols, they vary in implementation details. NCIP, for example, defines a number of transactions, which may not all be supported in each implementation. The ability for a resource sharing environment to operate efficiently without manual

duplication of transactions depends on mutual support of standard communications protocols.

While formally defined standard protocols continue to play an essential role in the way that library-oriented systems communicate with each other, APIs have gained use as a more modern and flexible mechanism for the exchange of data and services between systems. APIs are especially important as libraries increasingly need to integrate with systems outside of the library and to enable programmers to gain access to data and functionality not directly provided by built-in user interfaces or addressable by standard library protocols.

Auto-Graphics Extends Interoperability of SHAREit

Consortial interlibrary borrowing systems, such as SHAREit, depend on the integrated library systems used by the participating institutions to support standard protocols. These systems use Z39.50 to search a library's collection for virtual union catalog implementations as well as to interrogate the ILS for real-time availability of an item. SIP2 or NCIP protocols support automated requests and other interactions with the circulation module of the ILS needed to track an interlibrary loan request and fulfillment. But as libraries adopt new library services platforms that operate fundamentally differently than the traditional ILS, some of the conventional patterns can become disrupted. For an individual library participating in a broadly shared platform, exposing holdings to external applications may need to be handled differently than with standard library protocols.

In some of the state-wide resource sharing implementations managed by Auto-Graphics, challenges arose in how they would support libraries that had implemented OCLC's WorldShare Management Services. Auto-Graphics found that the way that Z39.50 was implemented for libraries using WMS was not consistent with what was needed to fully support the needs of SHAREit to validate the ability of a library to fulfill a request. The WorldShare Platform offers an API that is available to libraries and their partners. Auto-Graphics, in partnership with IndexData, was able to create a new connector for libraries using WMS that essentially translates requests that would otherwise be sent via Z39.50 into the OCLC WorldCat API. As a result of this work, libraries implementing OCLC's WorldShare Management Services can participate in SHAREit resource sharing to the same extent as those running conventional integrated library systems.

OCLC provided the following statement to clarify how the Z39.50 protocol is implemented for libraries implementing its WorldShare Management Services:

The WorldShare Management Services package does not include a Z39.50 Client, which is traditionally included with a legacy ILS for searching and downloading MARC records. With WorldCat as the WMS database of record, this functionality is unnecessary and redundant. Moreover, a Z39.50 Server is unnecessary for WMS libraries but is available to OCLC Cataloging subscribers (<http://www.oclc.org/support/services/z3950.en.html>). Member libraries can use Z39.50 to search WorldCat and even limit to specific library holdings in WorldCat. All WMS libraries are full cataloging subscribers and can use or have third-party partners use the Z39.50 Cataloging for any purpose.

WorldShare Management Services, WorldCat Discovery (currently in beta for libraries and not yet available to third-party partners), and WorldCat Metadata APIs (<http://www.oclc.org/developer/develop.en.html>) are a more robust and the preferred method for Create/Read/Update/Delete access to the WMS Library Services Platform.

This scenario involving SHAREit and OCLC WorldShare Management Services illustrates some of the transitions of technology underway. Some of the new library services platforms depart fundamentally from the ways that functionality is implemented in integrated library systems. How data and functionality are incorporated in a global multi-tenant platform differs from systems designed to be implemented for individual libraries or consortia. These new platforms also emphasize data exchange and extensibility via APIs. In most cases they will also provide support for the established library standards and protocols, but as seen in this example, there may be assumptions in the architecture of the protocols that may not align. The ability to exploit the APIs to implement a set of interactions that would otherwise be handled through a standard protocol reinforces the flexibility of this

approach. As these new platforms evolve and proliferate, it will be interesting to see whether APIs might eventually take precedence in other ways over long-established library-specific protocols.

Auto-Graphics Corporate Background

Auto-Graphics is a subsidiary of a publicly held company. Almost all of the other companies in the library technology industry are privately held under the ownership of a private equity firm, families, or individuals. The exception is OCLC, a nonprofit organization owned by its membership. Private companies do not have legal requirements to publicly disclose their financial details or business activities. Public companies must file financial statements to the SEC, and nonprofit corporations must file an IRS 990 that includes financial details and that is made available for public inspection.

Auto-Graphics, though a relatively small company, has been in business longer than any of the others in the library technology industry. During this long history the company has seen many transitions. The company was originally founded in 1950 as Cope Typesetting supporting the publishing industry with hot metal typesetting. As times and technologies changed, the company became increasingly involved in using computer technology for typesetting, and eventually in producing online databases. In 1969, the company began doing business as Auto-Graphics, Inc. as it became increasingly involved in library-oriented catalogs and databases. Auto-Graphics developed products and services through the evolution of media and technology, progressing through print, microfiche, CD-ROM, online databases, and most recently to Web-based systems and services.

A more detailed description of Auto-Graphics was included in the February 2012 issue of *Smart Libraries Newsletter*. Also see Chapter 3 of January 3013 issue of *Library Technology Reports*, addressing the topic “Resource Sharing in Libraries: Concepts, Products, Technologies, and Trends.”

Connecticut Opts for Open Source Interlibrary Loan

The State of Connecticut has operated a state-wide resource sharing system called reQuest, which has been powered by SHAREit from Auto-Graphics. This service includes a catalog of 5.8 million titles and 23 million items representing more than 400 public, academic, and school libraries in Connecticut.

A letter from State Librarian Kendall F. Wiggin dated April 16, 2015 announced that the state would discontinue the current version of request effective June 30, 2015 and will instead develop a new union catalog and interlibrary loan system based on open source software. The new system will be

created in partnership with Bibliomation, a consortium of 60 libraries sharing an Evergreen ILS.

This project will be based on Fulfillment, an open source resource sharing product based on Evergreen. The new statewide interlibrary loan service is anticipated to be available in Fall 2015, leaving a gap in service once the current request system is terminated.

Fulfillment was initially created by Equinox Software, contracted by a group of libraries led by OHIONET, which included contributions from the state libraries of Ohio, Kansas, Illinois, Indiana, Missouri, South Carolina, and Iowa. Equinox released Fulfillment 1.0 in February 2014, satisfying its software development contract. None of the sponsoring libraries has yet opted to make use of the software in production.

Update on Kuali OLE

The project to develop Kuali OLE as an open source library management system for academic and research libraries continues on track. To date, the project remains independent of KualiCo, a recently established commercial company to develop and support the community source business systems for higher education originally created under the Kuali Foundation. All the major projects, except for Kuali OLE, have announced engagement with KualiCo, including Kuali Student, Kuali Financial System, and Kuali Coeus, and Kuali Ready Continuity Planning. KualiCo performs development, support, and hosting services for these products. Kuali OLE remains under the governance of its own boards and councils and has independent funding. According to Mike Winkler,

Director for Digital Partnerships for the University of Pennsylvania and Senior Advisor for Kuali OLE, the project has funding secured through the planned development for Kuali OLE version 3.

Three libraries have placed Kuali OLE in production, including University of Chicago, Lehigh University, and the library of the School of Oriental and African Studies, which is part of the University of London. Each of these libraries is using Kuali OLE version 1.6. These institutions have not yet implemented the components of the system for electronic resource management and the Global Open Knowledge base supported in version 2 of the software. Other Kuali OLE partner institutions continue to plan for implementation in 2016–2017.

Axiell Acquires Elib

Continuing its phase of expansion, Axiell has made a strategic investment in the Elib, a company involved in the distribution of e-books in Sweden. Elib was founded in 2000 by four Swedish publishers: Bonniers, Norstedts, Natur & Kultur, and Piratförlaget. Through this investment Axiell has acquired seventy percent of the company, with the four publishers retaining a minority interest. Axiell has appointed Eva Houltzén, from Axiell Education and Media, as the Managing Director of Elib.

In recent years, Axiell has expanded and diversified its business activities. The company remains among the largest companies involved in library technologies, but has increasingly strengthened its products and services oriented to archives and museums. This move into the e-book arena represents another thread of diversification. The company has recently organized itself into three divisions, Axiell Public Library, Axiell ALM (Archives Libraries and Museums), and Axiell Education and Media.

Below is a timeline of Axiell's recent acquisition activity.

- Mar 2015: Elib, Swedish e-book distribution company
- Apr 2014: KE Software, an Australian company with software and services for museums and archives
- Nov 2013: Selago Design, a Canadian firm producing the Mimsy XG collection management and user interfaces for museums
- Aug 2013: Atingo, not an acquisition, but a new startup created with Publit to offer e-book lending services
- Mar 2013: Adlib, global company that produces versions of Adlib for archives, museums, and libraries

Axiell Group reports that its 2014 annual revenues totaled about \$50 million (SEK 405 million), representing a 20 percent increase over 2013. Despite setbacks in its library division, such as the loss of much of its business in Denmark to a national system awarded to Dantek, the company continues to see impressive growth as it expands its global reach and strengthens its products and services in the archives and museum sector.

People in the News

WT Cox Information has appointed **Michael Perrine** as its new Vice President of Sales and Marketing following retirement of **Michael Markwith**. Perrine comes to this promotion as a veteran of the company, serving previous roles including regional sales director and most recently as a Regional Vice President of Sales - Western US.

With WT Cox Information in two stints, 2007–2009 and 2012–2015, Markwith retires from a notable career in the library technology industry. Markwith previously was President of the US subsidiary of TDNet (2001–2007), a company based in Israel that offers a variety of electronic resource management and discovery products. Markwith was appointed president of TDNet, Inc. when it was established in February 2001. Other positions include: Vice President for Academic Sales for Swets Blackwell (2000–2001); Chief Executive Officer for Swets and Zeitlinger (1995–2000), and Sales Executive for SkyRiver (2009–2012).

Robert Miller was named as the Chief Executive Officer of Lyris, a non-profit membership organization based in Atlanta, GA. Miller was previously associated with the Internet Archive, serving as General Manager of Digital Libraries and was responsible for the creation and growth of its Digital Libraries, Division. Miller replaces **Kate Nevins**, who has led Lyris since it was formed in the 2009 merger of SOLINET, NELINET and PALINET, three of the former regional networks affiliated with OCLC. Nevins led SOLINET as its Executive Director from 1991, and continued leadership of the merged organization. Prior to joining SOLINET, Nevins was Vice President, Member Services for OCLC (1981–1991). Under Nevins' leadership, Lyris has found many opportunities beyond the original role of the incumbent organizations as providing services in support of OCLC. Lyris provides training and professional development services, licenses and discounts electronic content products for its members, has established a division to explore and promote open source technology, among its many products and services. In the area of technology, Lyris has been designated as the organizational home for both CollectionSpace and ArchivesSpace, open source projects supported by the Andrew W. Mellon Foundation.

Lyris saw a major change in the composition of its Board of Trustees with the appointment of four new members,

including **Joe Lucia** of Temple University, **Kathlin Ray** of the University of Nevada, Reno, **Gina Millsap** of the Topeka and Shawnee Country Public Library, and **Jo Budler** of the State Library of Kansas.

Axiell Group, a major Scandinavian company offering technology products for libraries, museums and archives, has hired **Maria Wasing** as its new Chief Marketing Officer. She previously served as Vice President of Global Marketing for Episerver and has served on the board of directors for Axiell for the last year.

Jessee Weaver has joined ByWater Solutions as a development specialist. ByWater Solutions provides services surrounding the open source Koha integrated library system. Weaver has previously worked with ByWater Solutions on a part-time schedule and has been involved with Koha at the John C. Fremont Library District in Colorado, which has used Koha since 2007.

Kuali OLE has hired **Heather Beery** as its new project Manager to coordinate activities among the various teams and boards involved across the institutions participating in the development of this open source library management system. Beery replaces **Patty Mescher** who has retired following eight years of involvement with the projects related to the Kuali Foundation. Mescher was appointed as Project Manager for Kuali OLE in July 2012.

Follett Corporation has appointed **Ray A. Griffith** as its new President and Chief Executive Officer following the retirement of **Mary Lee Schneider** from both this executive position and from membership of the company's board of directors. Griffith has served on the board since February 2013. Follett Corporation brings in \$2.6 billion in annual revenue and is the parent company of Follett School Solutions, which offers a variety of technology products and services for K-12 school libraries and districts. **Todd Litzsinger** serves as the chairman of the Follett Corporation board of directors and is a member of the Follett family which owns the company.

In other recent news, Follett Corporation acquired Neebo, the retail bookstore division of Nebraska Book Company, expanding its position in the campus bookstore sector. Prior to the acquisition, Neebo operated 2,000 and Follett operated 1,500 campus retail bookstores.



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July 2015 Smarter Libraries through Technology

Smart Libraries Newsletter

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The 2015 subscription price is \$85 in the United States and \$95 internationally.

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Production and design by the American Library Association
Production Technology Unit.

Smart Libraries Newsletter is published monthly by ALA TechSource, a publishing imprint of the American Library Association.

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