Newsletter

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Smarter Libraries Through Technology

Executive Perspectives

The library technology industry, as we have chronicled in *Smart Libraries Newsletter*, is increasingly dominated by a shrinking list of ever-larger corporations. Some of these organizations have broad portfolios of products, touching almost every aspect of library operations, content offerings, and services. Others remain focused on technology products, but even here consolidation has made an enormous impact, and these companies work hard to create new products to penetrate into new areas of interest.

As these organizations become larger with more complex and sophisticated product offerings, the strategies set at the top executive level can have a crucial impact on the library communities they serve. Naturally, these executives are charged with operating their companies in a way that satisfies their owners, investors, and boards. But they must also shape their business model to be conducive with their current and prospective library customers.

It is important for executives in this industry to have insight into the economic realities of libraries and to understand the values of the profession. It's rare for a new executive to come into the industry who has actual experience working in a library. It's much more likely that they will have come in from other businesses in related industries, such as publishing, the technology sector, or other business-to-business or business-to-consumer companies.

Doing business with libraries is unlike most other commercial sectors. Libraries, like other non-profits, have certain expectations for their commercial partners. First, they require technology products and services consistent with their missions and values. Libraries, for example, value objective access to their content and services and work to safeguard the privacy of their clientele. These premises differ drastically from those that push advertising content and extract every possible detail of consumer identity and behaviors. It is also important to understand the non-exclusive manner in which libraries acquire products and services. Few libraries will be willing to channel all their funds toward any single provider. It's essential to be able to procure content packages from a diverse set of providers in order to build collections well customized to the needs of their patrons and to purchase technology products and other supporting services that operate in a neutral way.

Those individuals leading companies that work with libraries must have realistic expectations regarding library funding levels and what constitutes reasonable pricing for their products. Libraries generally have modest budgets, which unfortunately are barely often able to afford even the bare essentials of what might be needed to support their missions. Companies that squeeze these budgets too hard will not stay in favor in the long term. It is also important for business strategies of library vendors to understand the long budget planning cycles typical in most libraries. Such an environment defies sudden changes in pricing or expectations that libraries will be able to make purchases on short notice.

Most of all, it is important for those in leadership positions in the library vendor community to understand the collaborative flavor of libraries. Libraries will work with their peers to the extent possible to reduce their costs and to increase the impact

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of their services. Libraries also appreciate vendors willing to treat them as partners rather than mere customers. Rather than expecting to deliver each product or service according to internally-developed processes, reaching out to libraries to help shape them will naturally be appreciated and will also result in producing more desirable and valuable offerings.

This issue of *Smart Libraries Newsletter* features the change of leadership at ProQuest, with Matti Shem Tov taking the reins of one of the most powerful and influential companies in the library industry. Shem Tov comes into this role following a very successful tenure leading Ex Libris, which has become the leading provider of technology products to academic and research libraries. Ex Libris was acquired by ProQuest over a year ago. This experience with Ex Libris should provide a valuable perspective as he enters this new role.

New Leadership for ProQuest and Ex Libris

The board of directors of ProQuest has announced that Matti Shem Tov, President of Ex Libris, will assume leadership of the entire ProQuest organization, succeeding current CEO Kurt Sanford. This change comes a year and 4 months after the acquisition of Ex Libris, a move that significantly expanded the position of ProQuest as a content, services, and technology company for libraries. This move represents an interesting change in ProQuest where the top leadership comes from the technology sphere rather than the publishing industry.

The transition from Sanford to Shem Tov will transpire gradually. Executive responsibilities will shift in the third quarter of 2017. Sanford will then remain in an advisory capacity through the end of 2017 before he exits the company. Shem Tov will report directly to the ProQuest Board of Directors, headed by Andrew M. Snyder. Ownership of ProQuest is privately held by Cambridge Information Group, which is owned by the family of Robert N. Snyder. Goldman Sachs has made major investments in ProQuest and holds a significant minority ownership position.

Shem Tov joined Ex Libris in March 2003 as President and Chief Executive Officer and has remained at the helm of the company through its multiple ownership arrangements. At Ex Libris, he led an executive team that achieved and sustained advancement of the company's position as a technology provider for academic and research libraries, which was based, to a large extent, on aggressive research and development strategies able to create new technology products with strong market appeal. Ex Libris has seen impressive growth in terms of extending its slate of product offerings, increasing the libraries adopting its products, steadily increasing revenues, and expanding its workforce.

The ownership arrangements of Ex Libris included:

- Hebrew University of Jerusalem (1980–2006), Tamar Ventures, and Walden Israel (1999–2006)
- Francisco Partners (June 2006–April 2008)
- Leeds Equity Partners (August 2008–November 2012)
- Golden Gate Capital (November 2012–2015)
- ProQuest (since 2015)

The continuity of Shem Tov's leadership of Ex Libris through these events stands in contrast to the normal course of events associated with a change of ownership. In most cases, new investors will install their own executive management team. The retention of Shem Tov and his management team reflect confidence and a sense of not wanting to disrupt a successful business and technology strategy. Key members of this executive team include Oren Beit-Arie, Chief Strategy Officer; Bar Veinstei, Corporate VP Resource Management Solutions; and Omri Gerson, Vice President for Development, Platform and Technologies.

During each period of ownership, Ex Libris was able to create or acquire new products that attracted interest for potential new owners and investors. During the period when the company was still owned by Hebrew University of Jerusalem, they had expanded the market for its Aleph integrated library system (ILS), had commercialized SFX, and had launched its Primo discovery tool. While it was affiliated with Francisco Partners, Ex Libris acquired Endeavor and its Voyager ILS, representing a major expansion of its customer base, especially in the United States. The development of Alma took place under Leeds Equity. When Golden Gate acquired the company, Alma was in a fairly early phase of marketing. By the time that ProQuest acquired Ex Libris, Alma had become well established as the dominant product for large academic and research libraries seeking a new technology platform. Ex Libris also launched its Leganto reading list management system and acquired the campusM mobile platform from oMbiel while it was under Golden Gate. These cycles of investment have resulted in new products

available to libraries and have strengthened Ex Libris' business position.

Kurt Sanford made many significant contributions during his tenure as its top executive. He joined ProQuest in July 2011 as President and CEO, succeeding Marty Kahn, who had led the company since 2007. Prior to ProQuest, Sanford served in several executive positions for LexisNexis culminating as its President of Global Operations for its global legal business. At ProQuest, Sanford led the company through significant business changes, building a more unified organization while extending its portfolio of products and services. Under his leadership, ProQuest expanded its business in several areas. Major business acquisitions included EBL Ebook Library, Pi2, Coutts Information Services, Ex Libris, and Alexander Street. In recent years, ProQuest has consolidated the technology platforms that deliver its content offerings. The new ProQuest Ebook Central, for example, brings together the capabilities of the ebrary and EBL—Ebook Library and provides new enhancements.

Sanford came to ProQuest from LexisNexis, where he served as President of Global Operations. His previous roles at LexisNexis included President and CEO of its US corporate and public markets, CEO of LexisNexis Asia Pacific, and Senior Vice President Large Law Firm Markets. Prior to joining LexisNexis, Sanford was a consultant at Bain and Company.

Prior to joining Ex Libris, Shem Tov was President of Surecomp, a global software development company specializing in the banking industry. Shem Tov earned a Master's Degree in Business Administration from Bar Ilan University in Israel.

Bar Veinstein, Corporate Vice President of Resource Management Solutions, will assume the role of President of Ex Libris. With his seven years of senior leadership, the company is expected to continue along a similar business strategy. Ex Libris will continue to operate as a business unit of ProQuest.

Sierra Powers National System for Ireland

Innovative Interfaces has completed the implementation of its Sierra library management system and Encore discovery interface for a shared automation environment for all of the public libraries in Ireland. This initiative includes 333 public libraries in the country with combined holdings of over 15 million library materials, serving the country's 4.6 million inhabitants. The public libraries in Ireland see an annual combined circulation of around 20 million transactions.

This new Sierra brings together all of the library authorities in Ireland that had been using several different incumbent ILSs. Dublin Country, the most densely populated area, was served by four separate library services, each using a separate instance of Axiell Galaxy. Twenty of the library services migrated from SirsiDynix Horizon and two were using SirsiDynix Symphony. Only one of the library services in Ireland was previously using Innovative's Millennium ILS.

This implementation completes a process that began in November 2013 with Innovative named as the successful competitor in September 2014.

(For more details, see "Ireland Selects Innovative for National Public Library System" in the November 2014 issue of *Smart Libraries Newsletter*).

TIND RDM: A New Platform for Research Data Management

It is essential for libraries to continually explore and expand the ways that they support their parent institutions or communities. Libraries serving academic libraries have been increasingly interested in finding areas of involvement outside traditional collection management services. One of these areas is facilitating the data produced by faculty research projects. This is an area that leverages the expertise of libraries in organizing and preserving data and fills a pressing need in the institution.

Managing, preserving, and making research data has become a growing burden for universities. Many funding agencies, notably the National Science Foundation, require that the projects they fund include a data management plan. Many libraries have stepped forward to work with researchers in the grant application process to help formulate these plans. The execution of research data management also provides an opportunity for the library to help the university

by providing the technical infrastructure and personal expertise.

TIND, a relatively new spin-off of the CERN research facility in Switzerland, has created a version of its repository management platform optimized for the management of research data. This company provides commercial services surrounding the open source Invenio software initially developed at CERN. Its products include the TIND IR for institutional repositories and the TIND ILS, which provides the full capabilities of an ILS.

The California Institute of Technology, or Caltech, has been an early adopter of the technology products supported by TIND. This institution became the first in the United States to implement the TIND ILS, migrating from a Millennium ILS from Innovative in October 2015 (see "Caltech Sets Tech Strategy Based on Invenio" in the August 2015 issue of *Smart Libraries Newsletter*).

Anticipating the need within research organizations, TIND has developed modules for its platform to provide the functionality needed to support the preservation and management of research data. This product, the TIND RDM, includes support for the DataCite metadata scheme developed to identify research data sets and facilitate their citation and retrieval (see **https://www.datacite.org**). TIND has incorporated support for the DataCite 4.0, the latest version of this schema into their platform and has worked with Caltech to create the functionality needed to support the management of research data. The product can make use of cloud-based services to accommodate the storage of research data sets that often require very large-scale capacity.

The TIND RDM has been placed into use to support CaltechDATA, a new service of the library to support the management and preservation of research data for the faculty and staff at Caltech. This service offered by the Caltech Library allows researchers affiliated with Caltech to upload and describe data sets for long-term preservation and access without direct cost. The repository allows published or unpublished data sets. Software used to produce the data set can also be submitted. While data sets are meant to be openly available, an embargo period can be set to temporarily restrict public access. The TIND RDM also provides an API to enable access to deposited data sets by external applications.

For more information on CaltechDATA, see **https://data.caltech.edu**.

For more information on TIND RDM, see **http://info.tind.io/rdm.**

Ex Libris also offers technologies to support the management and preservation of research data. These capabilities can be found in the company's Rosetta platform for digital asset management and preservation. The library of the Swiss Federal Institute of Technology Zurich, known as ETH-Zurich, has extended the use of its Rosetta implementation to support research data.

Recent System Selections

OCLC has announced that 23 additional libraries have selected WorldShare Management Services in recent months. Most of these libraries are associated with small to mid-sized colleges and universities. Some of those in the United States include Aquinas College in Nashville, TN, Becker College, Bergen Community College, Huston-Tillotson University, an HBCU institution in Austin, TX, Gustavus Adolphus College, Johnson C. Smith University, Nichols College, Oklahoma Christian University, Raritan Valley Community College, Southwestern Oklahoma State University, Trevecca Nazarene University, and Washington Adventist University. Many larger institutions have also implemented WorldShare Management Services, including Library and Archives Canada, covered in the June 2017 issue of *Smart Libraries Newsletter.*

Other major selections include:

- The Poplar Creek Public Library District in Illinois has selected Polaris, migrating from Symphony.
- The Cantonal and University Library of Lausanne has selected the Digital Archive solution from TIND to manage its legal deposit collection. This digital archive will be integrated with the library's Ex Libris Primo discovery interface.
- University of Genoa (Università degli Studi di Genova) has selected Ex Libris Alma to replace its current Aleph ILS. The university had previously implemented Primo as its discovery service.
- University of Nevada, Las Vegas, the College of Southern Nevada, and Nevada State College will collectively imple-

ment Ex Libris Alma and Primo, each migrating from Millennium.
- Université libre de Bruxelles will implement Ex Libris Alma, Leganto, and Primo, migrating from SirsiDynix Symphony.
- Marist College will replace its Voyager ILS with Ex Libris Alma and Summon. This installation is an example of Ex Libris' follow through on its commitment to offer Summon as a supported patron interface for Alma in addition to Primo.
- McMaster University in Canada has selected Sierra from Innovative Interfaces to replace its SirsiDynix Symphony ILS.
- The NC Live consortium in North Carolina has extended its existing program to offer ProQuest content to its 200 members. This updated arrangement now includes providing Summon, now supported by Ex Libris to provide access to this collection of resources.
- The Payson City Library in Utah has implemented Koha with support of ByWater Solutions to replace its InfoCentre ILS. ByWater also provided support to the library at Historic Hudson Valley in New York for its move to Koha.
- The John B. Coleman Library at Prairie View A&M University in Texas has selected Sierra from Innovative Interfaces. This library was previously using the Voyager ILS shared among multiple Texas A&M campuses and will move to a standalone instance of Sierra.
- 17 new municipal libraries have joined the Network of Libraries of Castilla-La Mancha in Spain sharing a Absys-Net ILS from Baratz.
- The Federated Library System of Bedford County has migrated to the Evergreen ILS shared by the SPARK consortium in Pennsylvania with support from Equinox Software.
- The NATO Defense College in Rome has selected OCLC WorldShare Management Services, migrating from EOS.Web.
- The Erie County Consortium in Pennsylvania have selected Polaris from Innovative and will migrate from SirsiDynix Symphony.

On the open source front, the Knowsley Libraries in the UK have opted to migrate to Koha with support from PTFS Europe. The San Diego Law Library has migrated from Millennium to Koha with support from Bywater Solutions. Emmaus Bible College in Iowa has implemented Koha with support from ByWater, moving from a Follett Winnebago ILS. The Memorial Library of Nazareth and Vicinity in Pennsylvania has joined the PaILS SPARK consortium to implement Evergreen, migrating from Library.Solution. The Haslet Public Library migrated from Book Systems Atriuum to join the North Texas Library Consortium's shared implementation of Evergreen.

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, Associate Editor for ALA TechSource, at simburgia@ala.org.

How is the industry adapting to and supporting BIBFRAME, and what can we do to begin preparing our records for a BIBFRAME conversion?

The move toward BIBFRAME as the foundation for bibliographic information ranks as one of the most significant events in the realm of technical services. One cannot overstate the importance of this initiative, but at the same time it's not a cause for alarm for libraries at this point. Any transition from MARC to BIBFRAME isn't going to happen overnight, and there is still time for vendors and librarians to get up to speed.

First, some background. The MARC formats emerged in the 1960s initially developed out of the work of Henriette Avram of the Library of Congress. This was the first standardized "machine readable cataloging" bibliographic structure, and it enabled crucial progress for libraries in their ability to collaboratively create and exchange records. MARC has steadily evolved to meet the complex needs of describing library materials and has been developed, often with variations, in all regions of the world.

Library automation systems have been programmed to adhere to the MARC standards. They provide advanced editing tools to enable catalogers to create MARC records, down

to the finest details of the fixed fields, tags, indicators, and subfields. MARC has become the center of the library bibliographic universe, with catalogers creating original records when needed and taking advantage of existing records whenever possible. An ecosystem has emerged where many different bibliographic services, with OCLC as the most prominent, assemble large collections of MARC records available to support copy cataloging operations. Until recently, the dominant model was for each library or consortium to maintain its own copies of records in a bibliographic database.

This bibliographic ecosystem based on MARC records is massive. It spans dozens, if not hundreds, of bibliographic services and many tens of thousands of ILS implementations around the world. The quantity of MARC records involved likely number in the billions. This installed base of records will exert considerable inertia against the momentum of change to new formats.

The reasons for change from MARC to BIBFRAME are compelling. While the MARC formats have been transformative for libraries, they have not been adopted by other types of organizations. The publishing industry, for example, despite many similarities in operational requirements, developed its own ONIX syntax. Most importantly, the broader information ecosystem seen on the web is based on other types of standards and protocols. While MARC communications format facilitates the interchange of data among library systems, the rest of the web uses XML, JSON, and RDF.

The web is increasingly taking on a semantic form, built on the concepts of linked data. In this realm, entities are stated as URIs that can be accessed with the HTTP protocol, with connections expressed through RDF (Resource Description Framework) or other serializations. The universe of linked data enables new types of discovery of information based on connections and relationships.

BIBFRAME attempts to bring the isolated realm of library bibliographic data into the universe of the semantic web. By encoding bibliographic description in terms of URIs and RDF triples, resources held by libraries are interconnected with data sets created by researchers in the scientific and scholarly community, with that of cultural institutions, or other information-oriented organizations. BIBFRAME emerged from the Bibliographic Framework Initiative of the Library of Congress. The initial articulation of BIBFRAME and a mapping of MARC formats into linked data was facilitated by Zepheira, a consulting company specializing in linked data technologies. (See "Bibliographic Framework as a Web of Data: Linked Data Model and Supporting Services." Library of Congress. November 21, 2012.)

BIBFRAME has continued to evolve and take a more stable form, with more tools and systems being developed to bring it into the realm of practical use. We are still not into a phase were BIBFRAME has taken a more operational role. It has been adopted for use in some projects and institutions, mostly as prototypes and research projects.

The transition to BIBFRAME seems at once inevitable and untenable. It has great momentum and support by the Library of Congress, OCLC, many national libraries, and other influential organizations as well as many leading librarians and technologists. Yet the massive installed base of MARC records, deeply ingrained processes, and lack of support in the existing technical infrastructure make it hard to imagine BIBFRAME as entering the mainstream of technical services in the short term.

The move toward BIBFRAME as the foundation for bibliographic information ranks as one of the most significant events in the realm of technical services.

That prelude frames the question asked regarding what the industry is doing to adapt for BIBFRAME and what libraries might be doing to prepare for it. I see a variety of strategies in play.

Many changes need to take place across technology systems to accommodate BIBFRAME. A self-enclosed record structure such as MARC requires a substantially different technical approach than a linked data approach like BIBFRAME. Discovery interfaces and resource management systems will both need to be substantially reworked to make the transition.

There are many aspects of library systems that remain fairly unimpacted by a change in the underlying bibliographic structure. Functionality relating to circulation, acquisitions, resource sharing, and electronic resource management make use of bibliographic records but more as a placeholder for identification, and they are relatively neutral to their underlying structure.

Cataloging modules that must import, export, and manipulate those bibliographic records must be programmed to work with different underlying structures. Many ILSs can already work with Dublin Core in addition to MARC formats. The transition from AACR2 to RDA: Resource Description and Access introduced the need to update cataloging systems to accommodate new fields and coding conventions in MARC records. Adding BIBFRAME to the mix will be needed at the point when those records become part of the bibliographic ecosystem.

Today, many automation systems remain in use that are approaching the end of their development cycle. It seems unlikely that vendors will re-invest in products approaching retirement to introduce support for a new bibliographic data model. The advent of BIBFAME may prompt some libraries to move on to more modern systems. But given that the time in which BIBFRAME might become crucial to library operations is at least a few years in the future, it probably does not put any wheels in motion for system migrations that are not already planned anyway.

Any system under active development will, or already have been, enhanced to accommodate BIBFRAME. The vendor and open source software communities have been active participants in the discussions surrounding BIBFRAME and have had ample opportunity to adjust their development roadmaps. The more recently minted library services platforms have been designed with flexible metadata models designed to accommodate current and future bibliographic formats, including BIBFRAME.

BIBFRAME and other linked data concepts might impact the timeframe of discovery interfaces and online catalogs in a shorter timeframe. Even if the back-end systems currently operate based on MARC, it is increasingly possible, and expected, for outwardly facing systems to exploit linked data. There are already services available to improve the discoverability of library materials by encoding structured data on resource pages, using schema.org or BIBFRAME. This technique enables web search engines to harvest the structured metadata and improve their performance in search results.

In the longer term, library discovery environments will likely be enhanced to enable users to navigate, browse, or make queries on the broader universe of open linked data. Current commodity discovery services operate based on large central indexes of pre-harvested metadata. In the future, new approaches to discovery could emerge based on linked data concepts.

Libraries can also prepare for the transition to BIBFRAME in several different ways. Many of these preparations, however, would be beneficial apart from this possible upcoming change in the bibliographic realm. BIBFRAME has been developed because of the strategic importance of linked data. Persons working in libraries should take this as an opportunity to build expertise in the concepts and technologies surrounding linked data and the semantic web. Regardless of the timing of when the systems and services libraries use to manage their core collections might make the transition to BIBFRAME, there may be opportunities to become more familiar with linked data and apply these tools in other aspects of the library's work. These opportunities might arise in how the library constructs its website, digital collections, or other projects involving metadata. Finding ways to expose metadata as linked or structured data provides benefits in gaining experience in the concepts behind BIBFRAME.

Libraries can prepare their records for BIBFRAME by doing the kinds of activities they would be doing anyway to manage their collections. Any conversion or migration, whether it involves a transfer from one system to another or a general change in format, benefits from high-quality metadata. Working to improve the internal consistency of the library's bibliographic and authority databases in MARC should benefit library patrons as they use the current generation of catalogs and discovery interfaces as well as pave the way for any new approaches coming our way in managing metadata.

Questions or suggestions for topics in future issues?

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Marshall Breeding's expert coverage of the library automation industry.

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