Smarter Libraries through Technology: Assessing Consolidation's Impact on the Industry Workforce

By Marshall Breeding

The library technology industry has been transformed over the decades through relentless rounds of consolidation. Mergers and acquisitions have eliminated some major competitors and left the industry dominated by a smaller number of large organizations. In working with the personnel statistics accumulated through the annual Library Systems Report for *American Libraries*, I was interested to see whether consolidation has resulted in an overall reduction in the workforce of the companies producing and supporting strategic technology products. For each year since 2002, the report's vendor survey has included statistics on the total number of personnel employed and how they are allocated according to categories such as development, support, sales, and administration.

Contrary to expectations, the size of the workforce in the industry's companies has seen only moderate reductions during the past dozen years. Though business consolidation has produced some episodes of personnel reductions, some companies have steadily added capacity. When considering the major companies active since 2002, the overall personnel resources industrywide have declined from 4,279 to 3,935 or about 8 percent. When considering individual consolidation scenarios, the net loss of personnel varies. Companies increasing their workforce have offset the personnel lost through mergers.

One of the key factors in business mergers lies in savings that can be achieved through reduction in personnel. When a company acquires another, both can be served through the same administrative personnel and processes. In most cases, the initial efficiencies are gained through combining executive administration, accounting personnel and systems,

Get Your Smart Libraries Newsletter Online in PDF!

Subscribers to ALA TechSource's *Smart Libraries Newsletter* can download PDF versions of the current and past issues at journals.ala.org/sln. For a limited period of time, *Smart Libraries Newsletter* and *Library Technology Reports* will be accessible without authentication. Starting in June 2015, only subscribers will have access to the most recent six months of *Smart Libraries Newsletter*. Access to *Smart Libraries Newsletter* and *Library Technology Reports* via the MetaPress platform ceased on March 25, 2015.

Thank you for subscribing! Your purchase funds advocacy, awareness, and accreditation programs for library professionals worldwide.

Table 1. Innovative and its acquired companies

Company	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Innovative Interfaces, Inc.	416	410	341	311	307	315	326	310	295	295	285	285	268
Polaris Library Systems		97	93	86	78	80	76	69	66	68	67	65	105
VTLS, Inc.		77	86	110	96	107	97	86	75	95	93	104	100
Total	416	584	520	507	481	502	499	465	436	458	445	454	473

Table 2. Impact of consolidation of Endeavor Information Systems into Ex Libris

Company	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Ex Libris	565	536	522	512	504	467	467	418	393	261	233	215	206
Endeavor Information Systems										156	175	167	161
Total	565	536	522	512	504	467	467	418	393	417	408	382	367

Table 3. impact of 2005 consolidation of Sirsi Corporation and Dynix

Company	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
SirsiDynix	421	385	369	380	385	400	450	491	629	679	394	445	406
Dynix											362	394	454
Total	421	385	369	380	385	400	450	491	629	679	756	839	860

and business infrastructure. The next steps of savings might come through a unified sales force representing all the products of the newly combined companies. Product support may be combined, though usually staffed by experts from the antecedent companies.

The elimination or consolidation of product lines will generally come at a much later stage of business integration, with development of major products from the acquired continuing for many years. In examples,where products have been eliminated soon after a merger, it has not been well received or financially successful. Few products have been eliminated through consolidation during this period. Symphony, Horizon, Voyager, and Aleph have all survived a previous round of mergers involving Ex Libris and SirsiDynix. The most prominent casualty was the Corinthian product under development by Dynix that was halted in the early days of ownership by Vista. Both SirsiDynix and Ex Libris plan to phase out aging products through very long-term strategies based on enticing libraries to their new platforms, Alma and BLUEcloud respectively. Given the persistence of products in the last phase of consolidation, prospects do not seem dire for libraries running Polaris, Virtua, and EOS.Web, products subject to acquisitions by Innovative and SirsiDynix.

Table 4. Impact of EOS International Consolidation into SirsiDynix

Company	2014	2013	2012	2011
SirsiDynix	421	385	369	380
EOS International		50	50	52
Total	421	435	419	432

To get a sense of the impact of specific mergers on personnel, I constructed tables that compare personnel statistics of companies before and after a merger. The basic idea is to compare the combined workforce of the separate companies with that of the merged organization.

Innovative has taken a relatively aggressive approach to the integration of its acquired companies. Apart from business acquisitions, the company has steadily increased the size of its workforce, generally adding capacity each year to support its growing customer base and development strategies. Innovative grew from 268 personnel employed in 2002 to 341 in 2012 when the company made its transition in ownership. VTLS,

Table 5. Industry-wide employment trends

Company	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Ex Libris	565	536	522	512	504	467	467	418	393	261	233	215	206
Endeavor Information Systems										156	175	167	161
SirsiDynix	421	385	369	380	385	400	450	491	629	679	394	445	406
-- Dynix											362	394	454
-- EOS International	0	50	50	52	52	66	79	82	82	79	72	69	69
Innovative Interfaces, Inc.	416	410	341	311	307	315	326	310	295	295	285	285	268
-- VTLS, Inc.	0	77	86	110	96	107	97	86	75	95	93	104	100
-- Polaris Library Systems	0	97	93	86	78	80	76	69	66	68	67	65	105
The Library Corporation	199	199	199	199	199	197	204	191	210	210	189	180	173
Infor	87	72	63	71	71	71	72	75	77	105	104	104	127
Book Systems	66	63	59	60	60	64	63	57	50	53	58	59	88
BiblioCommons	55	50	40	30	17	10							
Mandarin Library Automation	38	36	30	25	20	20	20	20	20	20	38	71	71
Auto-Graphics, Inc.	28	39	35	34	32	38	38	36	32	32	42	42	45
ByWater Solutions	19	14	13	13	15	4							
Equinox Software	17	18	20	21	22	28	13	6					
InfoVision Software, Inc.	10	10	10	11	10	10	10	10	10	8	8	8	4
Industry Total	3935	4069	3942	3926	3878	3886	3923	3858	3945	4066	4124	4211	4279
Change in FTE	-134	127	16	48	-8	-37	65	-87	-121	-58	-87	-68	
Percent Change	-3%	3%	0%	1%	0%	-1%	2%	-2%	-3%	-1%	-2%	-2%	
Change 2014 vs 2002 FTE	-344												
Change 2014 vs 2002 Percent	-8%												

Shaded boxes based on estimates rather than reported personnel counts

acquired last year, had seen some substantial cuts in personnel from a high of 110 in 2011 to 77 reported in 2013 prior to its sale to Innovative. This reduction aligns with the smaller number of sales seen for Virtua. Polaris has seen steady growth of its workforce since 2004, adding needed resources to support a growing customer base of ever larger and more demanding libraries. The cumulative personnel assets of the three companies totaled 584 in 2013, prior to consolidation. By the end of 2014, Innovative reported a workforce of 416, inclusive of the acquired businesses, representing a total loss of 168 positons, or a 28% decrease in personnel resources relative to what would have been in place among the three companies had they not consolidated. (See Table 1.)

When Ex Libris and Endeavor Information Systems consolidated in 2006, there was a net loss of 24 out of a combined pre-merger workforce of 417, or 5% net reduction. Personnel

statistics since 2002 also reflect that the company has steadily increased its workforce each year, which also contributes to the better-than-expected personnel numbers for the industry as a whole given the extent of mergers during this period. (See Table 2.)

SirsiDynix has gone through two sets of mergers since 2002. The initial SirsiDynix consolidation of Sirsi Corporation and Dynix in 2005, while under the ownership of Seaport Capital, resulted in a reduction of combined personnel resources from 756 to 679: a mild 10 percent reduction. Following its acquisition by Vista Equity Partners in 2006, SirsiDynix experienced a harsher reduction from 629 down to 491, an additional 22 percent, or a net 32 percent reduction from pre-merger. SirsiDynix trimmed personnel each year through 2012. The following year the company increased its personnel to 385 (Table 3). SirsiDynix reported an increase of 36 personnel since last year. Considering the 50 positions represented in EOS International, the combined companies showed a net loss of 14 positions or 3 percent (Table 4).

Globally, OCLC acqusitions have consolidated many companies, including Sisis Informationssysteme, Fretwell-Downing, BOND, Amlib from EnvisionWare, and HKA. Data are not readily available to assess the impact of these acquisitions.

This mini-study takes into account only a portion of the overall industry since it does not consider many of the small and medium-sized companies around the world. More extensive research might identify other trends and patterns. Yet for the companies and merger scenarios considered, the data suggests that personnel resources have become concentrated in a smaller number of companies, that the impact of consolidation has been uneven, and that all the surviving companies have increased in capacity over this period. (See Table 5.)

Boopsie for Libraries Grows with Platform-as-a-service

Boopsie for Libraries, a company specializing in mobile-friendly products and services for libraries, has recently launched a new service to assist publishers of content and other product developers to easily integrate with the integrated library systems used by their customers or subscribers. This service enables other businesses to leverage the infrastructure that they have created to support their products for libraries.

Boopsie has become established as a major provider of mobile apps for libraries. These apps enable libraries to offer access to their collections and services to community members who use mobile devices even if the libraries' online catalogs or other content products are not optimized for mobile access. The company found a foothold in the library mobile arena long before many of the providers of online catalogs and discovery services addressed this capability.

Mobile Discovery

The Boopsie mobile apps follow a similar data strategy to other discovery interfaces. Bibliographic records are harvested from and periodically synchronized with the library's integrated library system and indexed on Boopsie's platform as the basis for its catalog search feature. As patrons view individual items or make requests, the Boopsie platform obtains real-time status information from the ILS. Harvesting metadata and indexing on a separate platform provides opportunities to develop search and retrieval features more sophisticated than those offered through the native search of an ILS.

The creation of these mobile apps requires the development of connection mechanisms to each of the major ILS products to support data harvesting and interactive requests. Each ILS product requires a different set of protocol interactions, API requests, page parsing, or other techniques to support the metadata harvesting and real-time interactions required by a discovery interface.

Services supported include:

- Interactive search queries of the catalog according to keywords, by standard identifiers including ISBN, or bibliographic record key.
- Current shelf status and circulation availability for each item as identified by a unique barcode number.
- Ability for a logged-in patron to view current items on loan, items currently on hold, and any fines due.
- Ability for a patron to request an item be held or to cancel a hold previously placed.
- Direct self-service for charging or returning library materials without the use of a library-provided kiosk.
- The white-labeled Boopsie mobile app provides a standard set of capabilities to all libraries, delivered with their branding and customized presentation options. The customized app displays the library's logo, background image, and

color scheme. The library-branded app also incorporates library-specific info such as photos, opening hours, and other textual descriptions.

- Presents content beyond that directly cataloged, such as those from e-book lending providers.
- The app can also be enabled to include third party databases to which the library subscribes in search results.
- Boopsie also offers a responsive website with basic features to libraries subscribing to its mobile app and platform.

In most respects the data and platform architecture developed by Boopsie resembles that of other discovery services. Ex Libris Primo, ProQuest Summon, EBSCO Discovery Service, VuFind, Blacklight, and SirsiDynix Enterprise all harvest records from the ILS and provide real-time interactions through specialized connectors.

Mobile discovery requires specialized interface techniques due to the small screen dimensions and other limitations. In addition to the accommodating mobile devices through appropriate page widths, font sizes, and spacing of touch points, Boopsie has also created a proprietary search technology. A search component called "Smart Prefix" performs type-ahead optimized for mobile devices that presents search suggestions based on small numbers of letters across the words in title. This technique differs from type-ahead features in search engines, such as Google, based on full words or stems. Boopsie reports that this technology results in 2.4 times more searches being performed on smartphones or tablets compared to traditional keyword search with whole-word type-ahead recommendations.

Business Revolving Around Platform-as-a-service

Boopsie for Libraries offers a platform-as-a-service as the basis for its offerings to libraries. This platform provides the technical infrastructure that underlies the customized and branded apps it creates for libraries. It resides between the mobile apps it creates in software and the library's local servers. Each library's data are loaded and indexed on the platform as well as the mechanisms for real-time interactions with library servers for current status of content items and for patron requests. This platform-as-a-service strategy allows Boopsie create mobile apps for libraries much more efficiently than if these apps targeted the individual integrated library systems and other servers.

Another part of Boopsie's strategy centers on its capacity for app development. The customized apps are based on standard elements of functionality, which can be assembled for any library's implementation. Boopsie simultaneously creates native apps for each of the major families of mobile devices, including iOS, Android, Amazon Kindle, and Windows Phone. It also manages any required verification or certification needed for approval and distribution through the app stores, such as the Apple App Store, Google Play, or Amazon Appstore.

The Boopsie platform includes AccessILS, which translates requests made by a Boopsie mobile app to the native mechanisms appropriate for each integrated library system. AccessILS includes a set of connectors for each of the major ILS products, programmed to accommodate the specific mechanisms required by a given ILS, enabling support for any library using that product. The platform also communicates with the APIs of e-book lending platforms, discovery services, databases, and other content sources.

Supported products include:

- Carl.X ILS from The Library Corporation.
- Library.Solution or LS2 PAC from The Library Corporation.
- Encore discovery interface from Innovative Interfaces.
- Evergreen open source ILS.
- Aleph ILS from Ex Libris.
- Voyager ILS form Ex Libris.
- Millennium and Sierra from Innovative.
- Koha open source ILS.
- Polaris ILS from Innovative.
- Horizon ILS from SirsiDynix.
- Symphony ILS from SirsiDynix.

E-Book Integration

Especially for public libraries, integration with e-book lending services ranks as an essential feature for a mobile library app. Libraries want their patrons to be able to discover, check-out, download, and read e-books on their mobile devices through the fewest number of steps possible. Interactions with the e-book lending platforms, such as those from OverDrive, 3M Cloud Library, or Axis 360 from Baker & Taylor should happen behind-the-scenes and not require cumbersome hand-offs to those services.

Boopsie offers an option for OverDrive e-book integration, taking advantage of the OverDrive API to enable patrons to directly search the library's catalog, select an e-book, and read it without leaving the app. The patron does not need to download and install the OverDrive Media Console, but will need to log into their MyOverDrive Account.

Integration partnerships were reached with 3M Library Systems for its 3M Cloud Library in January 2013 and with

Baker & Taylor for Axis 360 in February 2015. An agreement with ProQuest to integrate e-books from its eLibrary service was completed in June 2014.

Library Self-service

In addition to features that enable patrons to access library services remotely, Boopsie also offers features that expand options for those visiting the library in person. Boopsie Book-Check allows patrons to use the camera on their smartphone to scan the barcode of items to perform self-check. For libraries which use electromagnetic theft detection strips or RFID security, patrons will need to have the books desensitized. Mobile phones lack the hardware capabilities to perform that part of the check-out procedure.

AccessILS Now Open for Business

Boopsie for Libraries developed the AccessILS set of middleware connectors to facilitate its own needs to communicate with a diverse set of ILS and content products. Its apps need only transmit a request to AccessILS, which then sorts out the communication with the ILS associated with the library of the patron and presents the current status of an item or completes a request within the app. Connectors can be added or modified without the need to change the programming of the apps themselves. Should a library change its ILS, its mobile apps will continue to function with only a change to its profile configuration.

To further leverage the AccessILS middleware, Boopsie is now making it available to publishers and other content providers. While Boopsie uses the AccessILS middleware to support its mobile apps, third party developers may use it to support other systems or interfaces. The API is agnostic relative to the type of device for which it services requests.

This offering provides the ability to communicate with any supported ILS through the single API of the AccessILS rather than having to address multiple and divergent APIs of each product. AccessILS obviates the need for a developer to write their own connectors for each ILS product. A single set of requests can be programmed to address the AccessILS API. As new versions of ILS products are released, Boopsie makes any needed changes in AccessILS, benefiting its own mobile apps as well as third party applications using the middleware.

Specific pricing for the AccessILS service is based on the number of transactions serviced and other factors. Developers interested in taking advantage of this service can contact Boopsie to negotiate pricing and receive documentation and a developer's key for technical access to the APIs.

Target Market

In its earliest years in business, Boopsie focused on providing its mobile products to academic and public libraries, but has since expanded its customers to include K-12 schools, corporate, government, legal, and military libraries. The company reports that over 4,000 libraries have subscribed to its mobile services. Consistent with increased concern by libraries to provide optimized services for mobile devices, Boopsie reported that it saw a 30 percent growth of new customers in 2014 over the previous year.

Boopsie has also expanded internationally. It recently formed an agreement with iGroup to distribute its products to libraries in Asia.

Corporate Background

Boopsie, Inc. was originally founded in 2006 by Greg Carpenter and Dr. Tim Kay.

Tony Medrano joined Boopsie in June 2013 as CEO, bringing a background as an educator and as an executive and in business development for other Silicon Valley companies involved with software-as-as-service, including Reply.com and SmartDrive Systems. Nicholas Wehr joined the company in April 2014 as its Executive Vice President for Technology. Wehr previously held positions at PRIMO Cinema, a secure content delivery platform for the movie industry. The original founders continue to be involved as non-executive advisors.

Boopsie is an independent Delaware corporation privately owned primarily by its founders and CEO. All thirteen individuals employed by the company have stock options. The company operates entirely from operating revenues and has no outside investment by venture capital or private equity firms. Medrano reports that this independence from investors has enabled the company's business strategy to focus on developing library-centric products and services instead of seeking short term profits or paying down debt. He continues, "Boopsie continues to grow into new markets, retain a very high percentage of its libraries as customers, and be rated by thousands of users surveyed as the library app platform with the best user experience."

ILS Providers Ramp Up Mobile

Boopsie found its niche of providing mobile interfaces for libraries well ahead of the integrated library systems and discovery services having adequate built-in support. In recent years, most of these providers have re-worked their patron facing interfaces to follow responsive web design or to offer native mobile apps. The company continues to maintain and expand its customer base

Table 6. Sample implementations and responsive web design

Product	Example	Responsive?
BiblioCommons	New York Public Library	Yes
Primo	Boston College	Yes
Summon v.2	University of Huddersfield	Yes
WorldCat Discovery Services	University of New Mexico	Yes
SirsiDynix Enterprise	Dunedin Public Libraries (BookMyne available as App)	No
EBSCO Discovery Service	Minnesota State University – Moorhead (EDS Mobile available as app)	No
Blacklight	Ghent University	Yes
VuFind	Villanova University Library	Yes
Innovative AirPAC	Utah State University	Yes
Encore 4.0	Adelphi University	Yes
Evergreen	Georgia PINES	Yes
Koha 3.16	College of the Redwoods	Yes
LS2 PAC from The Library Corporation	Tangipahoa Parish Library	Yes

through its ability to deliver mobile user experience, increasingly critical to libraries, superior to what is available from the provider of the library's ILS or other patron-oriented services. Even as its customer libraries implement new mobile-friendly responsive online catalog or search products, many will continue to offer their Boopsie mobile apps as an additional option.

In the current period, while an increasing number of ILS and discovery providers now offer either responsive interfaces or native apps, many still do not. Mobile support may available only in later versions of online catalog or discovery products, which may not yet be widely deployed. Online catalog modules that follow a responsive design that automatically detects and presents a mobile-friendly interface include Biblio-Commons, Ex Libris Primo, ProQuest Summon 2.0, Innovative's Encore 4.x and the open source Evergreen and Koha ILS products. Responsive catalogs have also been deployed using the open source Blacklight and VuFind discovery interface software. Table 6 lists sample implementations of the major online catalog and discovery products, indicating whether these live sites support mobile devices via a responsive design. We observe that these products are either responsive or that their providers instead offer mobile apps.

As ILS, discovery, and content providers increasingly offer their own mobile-friendly patron-oriented products, libraries may eventually be less dependent on specialized providers such as Boopsie. Others may prefer to continue to offer a native mobile app even if they have responsive interfaces. In the meantime, the demand to provide an excellent experience to library patrons with mobile devices is higher than ever and often unfilled by their currently installed products.

May 2015
Smarter Libraries through Technology

Smart Libraries Newsletter

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

TO SUBSCRIBE

To reserve your subscription, contact the Customer Service Center at **800-545-2433, press 5 for assistance**, or visit **alatechsource.org**.

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

ALA Techsource purchases fund advocacy, awareness, and accreditation programs for library professionals worldwide.