Integrated Library System (ILS) Challenges and Opportunities: A Survey of U.S. Academic Libraries with Migration Projects

by Zhonghong Wang

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An online survey was sent to academic libraries and consortia with an integrated library system (ILS) migration project, based on review of press releases from major U.S. ILS vendors. This study takes a systematic approach to provide a snapshot of the academic ILS market and key factors affecting the outcome of an ILS migration project. It reveals the challenges and opportunities facing academic libraries and ILS vendors in an environment with rapidly changing technology and increasingly sophisticated academic users.

Zhonghong Wang is Assistant Professor and Coordinator, Technology and Information Services, Brooklyn Campus Library, Long Island University, USA <iwang@liu.edu>.

Introduction

Libraries have been presenting users with organized and classified information for centuries. However, the once dominant status of academic libraries, assisting scholars and students in their pursuit of knowledge, is facing new competition from popular non-library entities such as Google and Amazon. Kohl finds the new competition present and clear "as academic resources increasingly find a universal home on the Web outside of libraries."[1] Kohl continues:

> For at least the last 200 years, no service or image has been more closely associated with the library than its catalog. Whether as a hand-written book, in card format, or as a digital entity, the catalog both defined and represented the library. Even the collection, without the organizing presence of the catalog, was simply a jumble of books and journals. The whole point of a library was not just assembling the world's knowledge, but assembling it in a manner which made it relatively easy to find, retrieve, and use. It was the library catalog which embodied both this principle and stood as an icon of the library's primary identity.[2]

This once unchallenged identity of libraries faces mounting pressure from outside Web forces. Libraries must work with vendors to build systems to integrate with new and reliable technologies, with features that are attractive to library users.

Rapid advances in library technology, providing accurate and immediate information about library resources and services to users, have contributed to the number of integrated library system (ILS) conversions and migration projects in academic libraries in the United States. As a result, new and improved functions are introduced to academic users of these automated library systems. Denda and Smulewitz state that major shifts in technology such as those evident in the development of the Internet and newer ILS developments have changed "the routine workflow in libraries from technical services to public services" over the past two decades.[3]

The ILS market has become increasingly competitive. As Breeding writes, "the Big News...was the acquisition of Dynix by rival Sirsi. The combined company, SirsiDynix, is by far the largest in the library automation

industry.... Folding two of the largest companies into one transforms the dynamics of the industry."[4] As the uncertainty of an unstable ILS marketplace grew, the 2005 merger of Sirsi and Dynix led to SirsiDynix's announcement in March 2007 of the discontinued development of Horizon (previously supported by Dynix) and consolidation of future ILS efforts on Unicorn (previously supported by Sirsi). In Breeding's words, "this news sent a shockwave through the library community, further breaking the increasingly fragile ties of trust that bind libraries with the companies they rely on for software to automate their operations and to deliver their content and services."[5] Academic libraries and ILS vendors are going through rough times as library administrators and systems personnel witness the volatile ups and downs of these companies, with some of which they have had long term relationships.

As SirsiDynix decided to maintain Unicorn and roll out Symphony as its flagship system and ceased to support Horizon, many libraries that run SirsiDynix's Horizon ILS system are faced with immediate challenges and difficult decisions. According to Breeding, "libraries that had established an automation strategy based on Horizon face a major change in course."[6] However, Breeding predicts that libraries will continue to "work with commercial vendors for automation. Even the open source route would likely involve commercial companies providing service and support."[7] Mergers like these change the landscape of the automation industry. Libraries must react quickly to the new challenges, as must ILS vendors.

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Fierce competition among ILS vendors trying to attract new customers has combined with demand among academic librarians and users of ever-increasing sophistication for improved and more user-centered systems. A systematic study of integrated online library system migration projects could serve to illuminate this unsettled environment.

Many library directors and information technology (IT) professionals have been in a position to evaluate integrated library systems in an effort to choose the best, if not the "perfect," system. Faced with decisions that involve millions of dollars, in-depth studies and analyses, various vendor demos, numerous focus group discussions, and countless hours of deliberation, choosing a vendor is only the first step. Solid system design, careful implementation, smooth production and thorough training are the keys to a successful conversion project.

There have been studies and scholarly communications regarding the selection and implementation of automated systems; however, many focused only on local experiences and individual accounts. A more systematic approach regarding migration projects is needed to present an overview of the current U.S. academic ILS market: the industry's movers and shakers, the pros and cons of the most popular systems, and the primary motivations for choosing particular systems.

This study examines the current ILS library market and ILS migration projects of academic libraries in the United States. An online survey was sent to academic libraries that have undertaken or are undertaking ILS migrations. Directors and system professionals were surveyed to obtain first-hand field experiences regarding the decision-making process, pre- and post-implementation, expectations for the new system, and lessons learned. The study provides an overview of top ILS vendors that have announced ILS migration contracts, as well as opinions and insights from library directors, systems professionals, and other key personnel.

This study focuses on the following areas: the market shares of the integrated library systems, reasons for migration, problems of old systems, objectives for new systems, add-on products, and future development. The author gathered information on the selection and decision-making process, implementation, and factors determining the outcome of an ILS migration project. Through analysis of the survey data, the author examined the pros and cons of the popular ILS systems, uncovered what did and did not work, and presented insights on new technologies and improvements most needed by academic libraries.

The findings offer a snapshot of the current academic ILS market in the United States and a summary of recent migration projects; they also provide a useful resource for library administrators and systems professionals who are in the process of evaluating and implementing new library systems.

Literature Review

In the years following the initial wave of converting card catalogs to integrated systems, IT and systems professionals as well as academic users, have become more sophisticated in voicing their needs and opinions to the ILS vendors.

Challenges

Constant demands from the academic community and systems professionals for better integrated library systems, accompanied by the ever-changing technology and innovations supporting more desirable functions and features, have created a very competitive ILS market with vendors fighting for new ILS contracts while trying to keep existing customers.

Marshall Breeding, the Director for Innovative Technologies and Research at the Jean and Alexander Heard Library at Vanderbilt University, has been one of the leading scholars and practitioners in the ILS field. The Library Technology Guides website, created and main-

tained by Breeding, is a comprehensive source of ILS-related information.[8] Breeding advocates for transparency and convenient access to migration and sales information as well as empirical data for "clues to help find the right match between library size and type and a suitable automation system."[9] One of Breeding's primary goals with lib-web-casts, a directory of library web sites and catalogs he maintains, is to bring "more transparency to the realm of library automation."[10] Information on ILS vendors, the market, user needs and new technologies is key to choosing appropriate integrated library systems for migration projects.

Many researchers and practitioners have written on the topic of ILS migration with emphasis on local and individual experiences. Fulich, Hirst and Thompson, of the University of Iowa, describe in detail their migration experience and, in particular, important stages such as system selection, project management and tracking, hardware, vendor and public relations, data conversion, system administration, table configuration, testing, training, local programming, staff client, production, reports, as well as new releases and software changes.[11]

New and innovative technologies bring changes to library systems, including ILS functions, with a mounting price tag. At the same time, librarians may feel the stress of a limited or shrinking budget. Soaring material, equipment and personnel costs have resulted in constant pressure from administrations to save money. Maquignaz and Miller point out that, when faced with a migration, libraries are restricted by the amount of money available to invest on new systems, as well as a limited number of major vendors from which to choose. Furthermore, libraries are often locked into retaining new systems for a significant period of time.[12]

The cost of acquiring an ILS represents a huge investment. Therefore, libraries take the selection process seriously. "Purchasing an automated integrated system for your library," according to Tebbetts, "is a major decision and one that has to be considered carefully."[13] Tebbetts stresses the importance of regarding automation as "a process" instead of "a one-time event," noting that no system "last[s] a life time."[14] She continues: "planning in this environment is quite different from planning a one-time purchase. Always, one must be thinking about adaptability and flexibility. The ability to change will be crucial to the success of the library's automation efforts."[15]

In Calvert and Read's study of librarians experienced with RFP processes and systems vendors who regularly respond to these requests, they identify three keys to success: communication, preparation, and documentation.[16] Though the RFP process is often lengthy, the study shows it can be beneficial to the selection team.[17] Ryan at University of California at Los Angeles (UCLA) shared his experience of "turning patrons into partners" when selecting an integrated library system.[18] His team started with the differences among various automation systems, and gathered input from faculty and students on how these differences would impact them the most. The selection team recruited faculty and students as "functional sponsors," who were invaluable to the selection process, helped reach more users, and advised on the creation of user surveys and the RFP. A series of focus group meetings also helped the selection team to gather user input on differences and trade-offs among three systems. Actively involving patrons helped the library selection team understand patrons' views better and, in turn, influenced their decision on ILS selection.[19]

Koneru points out that "it is imperative for libraries to design and develop an ILS that meets not only the present but also future demands and challenges. While designing systems and services, the primary factor to ponder over is users—their information needs and wants."[20] Koneru also stresses that staff competencies are critical when upgrading an existing system or implementing a new system.[21]

Leonhardt discusses issues of brand loyalty and the challenges of choosing library vendors. He lays out questions that library administrators and systems personnel should ask regarding the management of a company and its mission statement, trust in sales representatives, responsiveness to user requests and suggestions, and promotion of improvements to performance.[22] These factors have become extremely important as the ILS market has become more volatile and more competitive.

In addition to facing mounting financial pressure, libraries also face changes in perceptions regarding the link between information and the library, resulting from advances in new technologies.[23] According to Marshall Breeding and Carol Roddy's report of the 2002 ILS marketplace, "in the academic library sector, we expect strong demand for digital library systems, reference linking products, federated search tools, and other products that support multifunctional web-based library portals."[24]

Breeding and Roddy's 2002 study also reports that no single company "can be considered the leader overall."[25] Based on 26 Australian academic libraries and one American academic library, Maquignaz and Miller's survey reports that responses "indicated dominant library systems within academic libraries."[26] The responses reveal the need for the ILS to provide more integration with electronic services and other administrative systems and indicate that some libraries turn to solutions in other systems, overlooking the capacity of the ILS to accommodate various functions. Maquignaz and Miller state that ILS vendors "need to continue observing developments in client expectation and learning styles."[27] More flexible and customizable integrated library systems are needed by academic libraries.

Cervone summarizes a common frustration among library administrators and systems personnel: "although the individual circumstances that spur a migration vary from one library to another, a great degree of this renewed interest is being driven by discontent with current-generation systems and the vendor practices that have arisen in this era of vendor consolidation."[28] Frustration is also caused by unstable ILS vendors and

the volatile ILS market. Libraries may be forced to migrate to a new automation system as their old system ceases to exist due to vendor mergers. To make matters worse, the new ILS may not be much better than the old system.

Cervone characterizes the migration process as "complex, time-consuming, and expensive."[29] He stresses the importance of making a careful choice between staying with the current vendor or switching to another before "investing the time and trouble to migrate to a completely new system."[30] Library administrators and systems personnel should ask serious questions about their vendors before making a migration decision.

To ensure a successful ILS migration, administrators need to be well-informed consumers knowledgeable about library functions, the institution, and their academic community as a whole. An understanding of the nature of the ILS migration process and the setting of realistic expectations are critical to the success of any migration project.

Opportunities

According to Breeding, libraries face more competition to attract the attention of users "in an ever more crowded landscape of information providers" and need to utilize the best tools possible to retain the users' attention.[31] He stresses the urgency that "emerging next-generation interfaces provide a menu of options from which libraries can begin to deliver their content and services in a way that will be a hit with their users."[32] Libraries and ILS vendors must understand what users are expecting from library systems, including the Online Public Access Catalog (OPAC), and how users interact with these systems and technology.

Breeding points out that the challenges facing libraries—sparse resources, demands for more services with diverse collections, and limited staff—make it "more important than ever to have automation tools that provide the most effective assistance possible."[33] He continues to advocate for the relevance of the ILS and its importance as organizations automate basic operations to function well today.[34] Libraries and vendors must collaborate to identify issues that will lead to enhancing user experience of the online catalog.

In an attempt to reduce costs and encourage resource sharing, some libraries have turned to shared and hosted automation systems. In 2004, based on data from his projects tracking library automation systems and vendors, Breeding noticed an increase in the number of libraries choosing to share automation systems and opting to have vendors host their automated systems with an Application Service Provider (ASP) agreement.[35]

As users of traditional integrated library systems voiced dissatisfaction with existing systems on the market, a new form of ILS service emerged: the open source ILS. But in 2002, Marshall Breeding reported that, despite enthusiasm from the technology and computer support units of libraries, there was a lack of interest from library administrators "in taking on the risks and responsibilities of strategic reliance on open source library automation systems."[36] Felstead's survey of the literature on integrated library management systems published between 1999 and 2003 reveals the failure of open source software to "make much of an impact on the library systems marketplace and the continuing dominance of this market by the large integrated library systems of the commercial vendors."[37]

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The open source automation market has developed over time and some libraries have taken the big step toward open source automation systems. Breeding's study of the ILS marketplace in 2007 reveals trends in open source ILS migration.[38] One trend is a tendency for early adopters of open source ILS's to base their decisions on "a philosophical perspective rather than through a competitive process."[39] Another trend is the emergence of commercial support of open source automation projects. He characterizes "the open source ILS movement today as being in a cozy honeymoon period," that is, users are not taking a critical approach to open source ILS at this point. According to Breeding, "open source library automation systems need to compete head-to-head with the proprietary systems on their own merits" in order to reach "a higher level of maturity."[40]

Even though there has been a rise in the number of libraries choosing an open source ILS, the majority of academic libraries still work with vendors of traditional ILS's. Many are keeping an open mind regarding the development of new systems.

In order to attract today's high-expectancy, Web-savvy library users, Breeding urges offering attractive and compelling OPAC interfaces "paired with high-quality content...selected and created by librarians."[41] What are the characteristics of a Next-Generation OPAC? Coyle foresees the focus of future catalogs shifting from holdings to user.[42] Users today are accustomed to the dynamic and interactive nature of the Web, as well as social networking tools. Many of them use Web tools to find the information they need. In order for OPACs to attract these sophisticated users, the underlying integrated library systems need to meet their demands, particularly, those of technologically adept college students.

Methodology

The author examined press releases of the major ILS vendors from January 2004 to May 2008 to obtain a list of 63 academic libraries and consortia engaged in an ILS migration with one of the vendors during that period.

Definition of Major ILS Vendors

For the purpose of this study, the operational definition of a "major ILS vendor" is defined a company in the academic, public and consortia marketplace with significant numbers of installations and support contracts. *Library Journal*'s annual Automated System Marketplace maintained by Marshall Breeding provided critical information for the author to determine which vendors to include in this study.[43–49] According to Breeding's 2008 marketplace report, the cumulative total sales from 2003 to 2007 are: 617 (Horizon), 560 (Millennium), 541 (Unicorn), 283 (Aleph 500), 241 (Library.Solution), 184 (Virtua), and 107 (Voyager). Breeding also reports the numbers of total systems installed: 1991 (Aleph 500), 1704 (Unicorn), 1612 (Horizon), 1289 (Millennium), 1179 (Voyager), 926 (Virtua), and Library.Solution (700).[50] Based on the number of systems installed, size of revenues, number of employees and percentage of market share, the following vendors and systems were chosen: Ex Libris (Aleph), SirsiDynix (Horizon, formerly known as Dynix before the SirsiDynix merger), SirsiDynix (Unicorn, formerly known as Sirsi), Innovative Interfaces, Inc. (Millennium), Ex Libris (Voyager, formerly known as Endeavor Information Systems before the Ex Libris acquisition), VTLS Inc. (Virtua) and The Library Corporation (Library.Solution).[51–53]

When this study began, in June 2006, there were seven (7) major ILS vendors in the U.S. market: Dynix, Endeavor, Ex Libris, Innovative Interfaces, Sirsi, TLC, and VTLS; all except TLC, which is a key vendor to public and school libraries, are major players in the domestic academic library sector. By June 2008, Ex Libris had merged with Endeavor (Ex Libris) and Sirsi had merged with Dynix (SirsiDynix). The decision was made to consider only those major vendors having migration contracts with academic libraries and consortia from January 2004 to May 2008. TLC, a major player in the public library ILS market, was originally included in the study, in consideration of its size. However, since TLC was not awarded any academic library contacts during the period of the study, TLC was removed from further consideration. Therefore, the original seven (7) ILS vendors in the study were reduced to four (4) by the end of the study period.

Population and Sample

The population of this study comprises all the academic libraries, defined for the purposes of this study as libraries serving colleges, universities and other post-secondary institutions of higher education, undergoing an ILS migration project by one of the major ILS vendors between January 2004 and May 2008.

Survey Development

No pretest was conducted, but survey drafts were revised based on input from colleagues. The questions were designed to collect data relating to the objectives to present a snapshot of the academic ILS marketplace in a systematic manner and to accumulate first-hand information from systems professionals and administrators who have experienced ILS migrations. Questions in the survey focus on demographics and types of institutions, funding, selection process, likes and dislikes of the old and new integrated library systems, reasons for migrations, expectations for the new system, lessons learned, and future development (Appendix A).

Data Collection Procedures

All press releases from the defined major ILS vendors for the period from January 2004 to May 2008 were retrieved from the vendor websites and the Library Technology Guides website. Where available, press releases were obtained from vendor websites. The author was able to obtain all the press releases within the research period from the websites of Innovative Interfaces, Inc. and TLC; the remaining press releases were obtained either from the respective companies' websites or from the archives of the Library Technology Guides website. Due to mergers and acquisitions that had taken place among the ILS vendors, some information on companies and their migration contracts ceased to be available on their websites. Also, different companies have different policies about making historical press releases available to the public. As a result, press releases also had to be obtained from the archives of the Library Technology Guides website, maintained by Breeding; this source was essential to conducting this project. The author grouped these libraries by type. The author was able to compile data on U.S. academic libraries that had completed an ILS migration project or signed a contract to do so with one of the major ILS vendors and generated a list of 63 academic libraries, including a few consortia; only consortia determined to be consisting primarily academic libraries were included. Information regarding the migrations was entered into a Microsoft Excel spreadsheet. A survey was developed and sent to all 63 libraries and consortia in early June 2008.

The URL linking the online survey was sent out via e-mail on June 6th and 7th, 2008, with a deadline of June 30th, 2008. The survey was anonymous and was extended to July 20th, 2008, in consideration of the time period—late June and early July, a time when many library personnel take vacation or attend the American Library Association (ALA) Annual Conference. After the initial e-mail with the survey link was sent to the respective individuals, two subsequent reminders were sent in mid-June and early July. If a referral was provided, the author invited the recommended person to complete the online survey. A total of 33 individuals responded to the online survey, with a response rate of 52.38%.

Academic institutions, libraries, and key personnel in charge of the ILS projects were identified. The press

releases were organized by vendor. The author examined these press releases for content analysis and tagged those announcing an ILS migration project by looking for keywords such as "selected," "has selected, "signed," "has signed," "launched," "agreement," "implement," "new customer," and "switching."

After the list of academic libraries was generated, key library personnel were tagged for further verification. Data on the primary library personnel identified in the press releases were collected and verified via the Internet regarding their current work locations. If a person changed jobs or retired, the survey was then sent to the dean or director of the library. If no one from the library was referenced or quoted in the press release, the survey was also sent to the dean or director of the library. In addition, e-mails with the link to the online survey were sent to one contact at each of these libraries. Only one person at each library or consortium was contacted. If more than one person was named in a press release, the one with the more technical responsibility was chosen. A request to forward the survey to an appropriate respondent was included.

Data Collection Tools

Survey responses were collected via StudentVoice, an online survey provider.

A spreadsheet was created using Microsoft Excel with variables such as domestic, international, vendor, press release date, library name, library URL, country, state, new system, old system, number of libraries in the consortium, expected live date, library type, as well as key personnel name and position.

After the 63 U.S. academic libraries were identified, the author looked up the key personnel identified in the press releases via the websites of these libraries to verify their current work locations and titles. Information such as e-mail and street addresses were also collected during this process.

Data Analysis

Answers to multiple choice questions and comments were analyzed. Free text entries and comments were coded and grouped based on content. Tables and figures were created from the online survey results and further compiled by the author.

The Vendor Pool

Originally, seven (7) ILS vendors were considered as candidates for this project. Although TLC is a major ILS player in the public library market, in consideration of the size of the company, the author decided to retrieve its press releases as well. However, since TLC was not awarded any academic library contracts during the past four and a half years, the company was removed from this study. Furthermore, mergers occurred between Ex Libris and Endeavor (Ex Libris) and between Sirsi and Dynix (SirsiDynix). As a result, the total number of vendors examined in this study decreased from seven (7) to four (4). The following ILS vendors were included in this study: Ex Libris (includes Endeavor); Innovative Interfaces, Inc.; SirsiDynix (includes Sirsi and Dynix); and VTLS. Since the two most recent mergers between Ex Libris and Endeavor and Sirsi and Dynix occurred during the course of the study, the original names of these companies and systems have been retained where applicable.

The Library Pool

The 63 academic libraries and consortia included in this study are located in 25 states. Duplicates were removed. The largest number of academic libraries migrating to a new ILS during the course of this study is located in California, eleven (11) in total; six (6) libraries are located in Texas; followed by five (5) in Michigan; and four (4) in New York. The following states Massachusetts, Pennsylvania, Tennessee and Virginia each had three (3); followed by Arkansas, Iowa, New Jersey, Oregon, South Carolina, Vermont, and Wisconsin, each having two (2) migration projects. The following states each had one academic library with a migration project: Alabama, Arizona, Georgia, Kansas, Kentucky, North Carolina, North Dakota, Ohio and Utah. Fig. 1 illustrates these 63 libraries by state.

The institutional types were verified via the Institution Lookup tool on the Carnegie Foundation for Advancement of Teaching website.[54] Of the 63 libraries and consortia, more belong to private institutions (54%) than public (38%). Three libraries (5%) are part of a consortium and the remaining two (2) libraries (3%) belong to institutions not found on the Carnegie Foundation website (Fig. 2). Duplicate library and consortium names were removed from the list of 63 academic libraries and consortia for this study.

Fig. 3 illustrates the number of academic library contracts awarded to the major vendors based on information from press releases between January 2004 and May 2008.

During 2007 and 2008, Innovative Interfaces, Inc. signed the most ILS migration contracts. The company also had 13 contracts in 2006, including three (3) California State University campuses. The data also showed that Endeavor signed a large number of contracts—ten (10) in 2004 and four (4) in 2005 prior to its acquisition by Ex Libris.

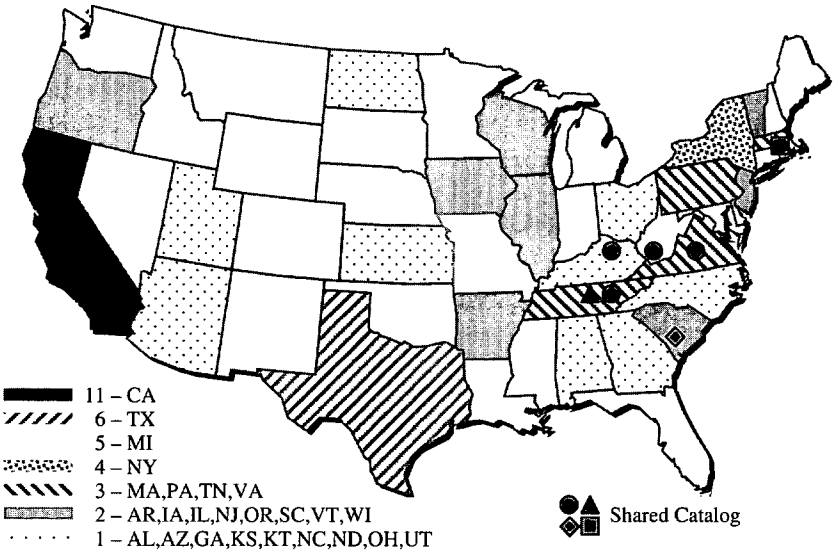
Results

The author analyzed the survey results based on responses from 33 U.S. academic libraries to the online survey.

Respondent, Institution and Library

The survey gathered information about each respondent, his or her institution and its library. When asked about the position held, of the 33 respondents, 54.55% were "Dean of the Library/University Librarian/ Director," followed by "System Librarians" (15.15%) and "Other" (30.30%), which was further specified as "Associate Director," "AUL for Technical Services," "Director of Technical Services," "Executive Director," "Library System Coordinator," "Systems Analyst" or "Technical Services Librarian." In terms of the institutions, 78.79% were single campus institutions and

Figure 1
Libraries and Consortia by State ($n = 63$).

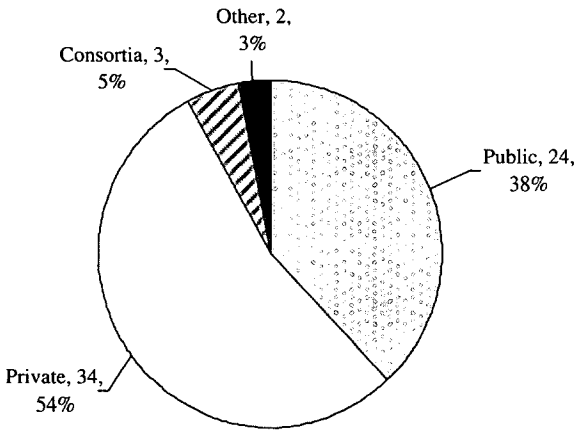


21.21% were multi-campus institutions, ranging from 2 to 58 campuses.

Of academic libraries reportedly undergoing ILS migration projects during the study period, California accounted for the highest number, six (6) in total; Michigan had four (4); followed by Illinois, Iowa, Oregon, Tennessee, Texas, Vermont, and Virginia, with two (2) each. The following states each had one academic library with a migration project: Arkansas, Kansas, New Jersey, New York, North Carolina, North Dakota, Pennsylvania, South Carolina and Wisconsin. Fig. 4 illustrates the geographic representation of these 33 libraries and consortia.

The academic libraries in this study vary in size and population served. Thirty-one respondents reported the size of their student population (Table 1), which ranged from 97 to 174,000 FTEs and the size of their faculty body (Table 2), which ranged from 15 to 3000 FTEs.

Figure 2
Institution Types ($n = 63$).



Twenty-four of the 32 respondents (75%) reported that their library serves a single campus; five (5) or 16% of respondents are from multi-campus library systems, and three (3) or 9% belong to a consortium.

ILS Funding

Respondents were asked to provide funding information for the ILS migration. Out of the 37 responses, the breakdown was as follows: "Library's budget" (43.24%), "Special allowance from the institution" (37.84%), "Grant(s)" (8.11%) and "Jointly-funded" (5.41%) by the library budget and special funds from the institution.

Figure 3
Contracts Based on Press Releases ($n = 63$*).
***One additional contract was awarded to Innovative Interfaces, Inc. for a consortium that was already included in the study. Another contract was awarded to VTLS, but the library migrated to a different system. Duplicate library and consortium names were not included.**

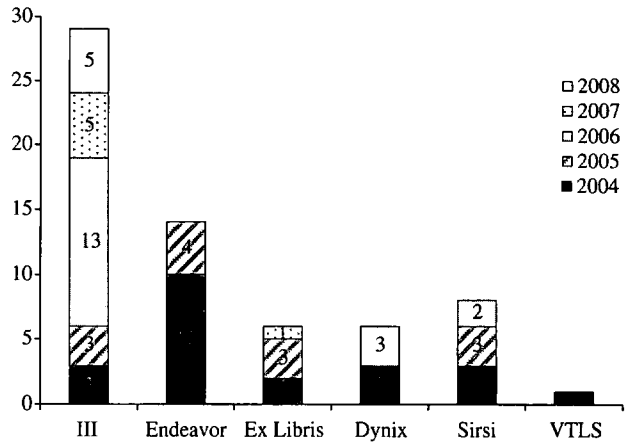
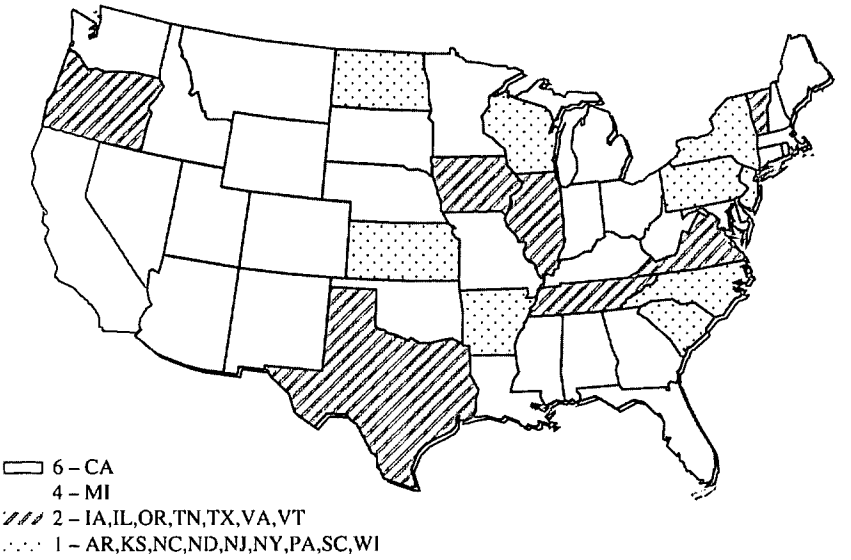


Figure 4
Respondent(s) by state ($n = 33$).



For those who answered "Other" (5.41%), one indicated "Donation" and the other "State Appropriation."

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When asked whether the cost exceeded their initial budget allocation, an overwhelming majority of the 32 respondents (97%) answered "No." Only one respondent (3%) answered "Yes" with a 100% increase.

Old ILS

Respondents were asked to provide information about the vendors (Table 3) and systems (Table 4) of their old ILS.

Survey respondents were also asked to provide the number of years operating under the old ILS.

The average time was 8.89 years, with a range extending from 1 year to 20 years. Of 28 respondents, 17.86% reported having their old system for 10 years, followed by 10.71% each with 8 and 15 years. The data showed that 75% of the libraries were with their old system between 7 to 20 years.

Close to two-thirds of the 32 respondents (62.50%) reported that the old system was their first integrated

Table 1
Student Population Served ($n = 31$).

Number of students (FTE)	Number of libraries	Percentage (%)
Under 1000	8	25.81%
1000–1999	5	16.13%
2000–2999	1	3.23%
3000–3999	3	9.68%
5000–5999	1	3.23%
6000–6999	1	3.23%
8000–8999	3	9.68%
10,000–19,999	2	6.45%
20,000–29,999	5	16.13%
30,000–39,999	1	3.23%
174,000	1	3.23%

Table 2
Faculty Population Served ($n = 28$).

Number of faculty (FTE)	Number of libraries	Percentage (%)
Under 100	10	35.71%
100–199	4	14.29%
200–299	3	10.71%
300–399	1	3.57%
400–499	1	3.57%
500–599	1	3.57%
700–799	1	3.57%
800–899	1	3.57%
1000–1999	4	14.29%
2000–2999	1	3.57%
3000–3999	1	3.57%

Table 3

Vendors of Old ILS ($n = 29$).

Vendor	Number of libraries	Percentage (%)
DRA	5	17.24%
Dynix	4	13.79%
Ex Libris	4	13.79%
Geac	3	10.34%
Endeavor	2	6.90%
Innovative Interfaces, Inc. (III)	2	6.90%
Sirsi	2	6.90%
SirsiDynix	2	6.90%
Brodart	1	3.45%
EOS International	1	3.45%
NOTIS, Geac, Endeavor and TLC	1	3.45%
The Library Corporation (TLC)	1	3.45%
VTLS	1	3.45%

library system. When asked when their first ILS was implemented, of nine (9) valid answers, the most recent response was 2002 and the oldest was 1984. Specifically, 22.22% migrated in the 1980s, 33.33% were completed between 1990 and 1995, 33.33% between 1997 and 1998, and 11.11% in 2002.

When asked about other ILS systems implemented, of ten (10) responses, three (3) libraries previously implemented Millennium from Innovative Interfaces, Inc., six (6) implemented the following systems: CLSI, Geac Advance, Horizon, Inlex, Notis and Sirsi Unicorn, and one (1) library reported a TLC system.

The survey asked the respondents to list the ILS modules in production prior to migration or upgrade. Thirty (30) respondents provided the following information: all libraries (100%) had Cataloging, Circulation and OPAC in production; twenty-one (21) libraries (70%) had Serials module in place; nineteen (19) libraries (63.33%) had Acquisitions and Reserves modules; five (5) libraries (16.67%) had InterLibrary Loan modules; and two (2) libraries (6.67%) had Report modules.

Three (3) respondents also listed the following non-ILS products in production prior to their most recent ILS migration: E-Reserve (ERes) from Docuteck, ILLiad from OCLC, and locally-developed Serials, Binding Control, and Acquisitions Fund Accounting.

Table 4

Systems of old ILS ($n = 26$).

System	Number of libraries	Percentage (%)
Voyager	5	19.23%
Classic	3	11.54%
Advance	2	7.69%
DRA Classic	2	7.69%
Horizon	2	7.69%
Millennium	2	7.69%
Aleph 500	1	3.85%
ALIS	1	3.85%
Amlib	1	3.85%
Dynix Classic	1	3.85%
EOS	1	3.85%
Geac[a]	1	3.85%
NOTIS, Geac, Endeavor and TLC[a]	1	3.85%
Unicorn	1	3.85%
SirsiDynix[a]	1	3.85%
VTLS[a]	1	3.85%

[a] No system name was given by the respondent.

New ILS

Respondents were asked to name the vendors and systems of their new ILS (Table 5).

Respondents were asked when their most recent ILS migration was implemented (Table 6) and the time required to perform the migration (Table 7). The data revealed that 68% of the reported migration projects were implemented since 2006. In addition, one additional library is currently undergoing an ILS migration.

Close to two-thirds of the respondents (66.66%) reported that six (6) to twelve (12) months were required to migrate to their new ILS.

The survey also asked about the ILS modules or functions in production with the new system. Of 29 respondents providing the information: all libraries (100%) had Cataloging and OPAC in production, followed by Circulation (96.55%), Serials (93.10%), Reserves (89.66%), Acquisitions (82.76%), and InterLibrary Loan (24.14%). Those choosing "Other" (27.59%)

Table 5

Vendors ($n = 27$) and Systems ($n = 27$[a]) of New ILS.

Vendor	System	Number of libraries	Percentage (%)
Innovative Interfaces, Inc.	Millennium	19	70.37%
Ex Libris	Aleph	2	7.41%
Ex Libris (Endeavor)	Voyager	2	7.41%
SirsiDynix (Sirsi)	Unicorn	3	11.11%
SirsiDynix (Dynix)	Horizon	1	3.70%

[a] An additional respondent reported using the Koha system, an open-source ILS.

Table 6

Time When New ILS Was Implemented ($n = 25$).

Year(s)	Number of libraries	Percentage (%)
2004	3	12%
2004–2005	1	4%
2005	4	16%
2006	4	16%
2006–2007	1	4%
2007	7	28%
2007–2008	1	4%
2008	4	16%

specified such ILS or non-ILS products as electronic resource management (ERM), media management, union catalog, federated searching and link resolver.

Information on non-ILS products was provided by respondents implemented or to be implemented as part of their ILS migration: ERM, WebPacPro, ContentCafe, Federated Searching, Patron API, LDAP, Millennium Scheduler, and ILLiad for InterLibrary Loan.

ILS Selection Process

Table 8 shows the time necessary to select a new system based upon 25 valid answers. Of 25 respondents, 40% reported that it took 6 months to select their new system, followed by 16% each reporting 1 year or 2 years.

With regard to their choice of selection mechanism, respondents were presented with a list and asked to "check all that apply." Of 29 respondents, 21 or 72.41% chose "Committee/Task Force," 14 or 48.28% reported "Site Visits," 4 or 13.79% used "Surveys" and one (1) or 3.45% utilized "Consultant." Eleven respondents (37.93%) who answered "Other," provided further detail such as: vendor demo, information from sister system campuses, literature search, and online site comparisons. One respondent reported that no mechanism was used to select the new ILS.

Table 7

Time It Took to Migrate to New ILS ($n = 27$).

Time	Number of libraries	Percentage (%)
3 days	1	3.70%
2 weeks	1	3.70%
2 months	3	11.11%
3 months	2	7.41%
4 months	1	3.70%
5 months	1	3.70%
6 months	9	33.33%
8 months	2	7.41%
9 months	3	11.11%
12 months	3	11.11%
18 months	1	3.70%

Table 8

Time it Took to Select the New ILS ($n = 25$).

Time	Number of libraries	Percentage (%)
3 months	2	8%
4 months	2	8%
6 months	10	40%
1 year	4	16%
2 years plus	4	16%
3 years	1	4%
No time, mandated	1	4%
None, consortial choice	1	4%

Reasons for Migration

The respondents were asked to list the top five primary reasons for their ILS migration or upgrade. Twenty-eight (28) respondents gave a total of 102 reasons, which yielded in the following top five primary reasons: 1) Better system/Functionality in new system, 2) Diminishing Support of old system, 3) Consortium Requirement, 4) Insufficient Old System Features, and 5) Aging System/Hardware. Other reasons included: Cost, Vendor Merger, Vendor Stability and Customer Support.

Respondents were asked what they liked and disliked about their old integrated systems. Of 21 respondents, nearly three-quarters (71.43%) listed their reasons for liking the old system; these included: easy to use, dependability, inclusion of many functions, circulation, easy customization, most configurable OPAC, integrated, cheap, character-based, relational database access, nice search engine, and good system in its day. The rest of the respondents (28.57%) reported that they liked nothing about the old system. Of the 24 respondents who reported their reasons for disliking the old system, two-thirds (66.67%) listed the following: limitations such as lack of integration; support and development; non-relational database structure; capability; expandability; workflow; and command. 16.67% reported that they disliked everything about the old system. 8.33% reported they disliked nothing about the old system. Another 8.33% chose "Other," which they further explained as being denied some access to software by University IT due to security issues and old system becoming obsolete.

The respondents were also asked what they like and dislike about their new integrated systems. Out of the 24 respondents, 83.33% reported that they like the new system for the following reasons: better and increased functionality and performance, flexibility, and ease of use. In addition, 12.50% like the customer support service. Another 4.17% report that they like nothing about their new integrated systems. Twenty-one (21) respondents report the following dislikes: non-standard or proprietary aspects (28.57%); increased complexity

(23.81%); bugs and implementation problems (14.29%); integrating with add-on products (9.52%); cost (9.52%); and support team (4.76%). Another 9.52% report that they dislike nothing about the new integrated system.

Of 26 respondents, 84.62% felt their expectations had been met, while 11.54% indicated that their expectations had been somewhat met, and 3.85% indicated that their expectations had not been met. Specifically, two (2) respondents expressed their dissatisfaction and concerns regarding the new system losing some functions from the old system and the assignment of a migration specialist who had no understanding of their previous system. Another reported the librarians' contentment with features of the new system and the migration process in general.

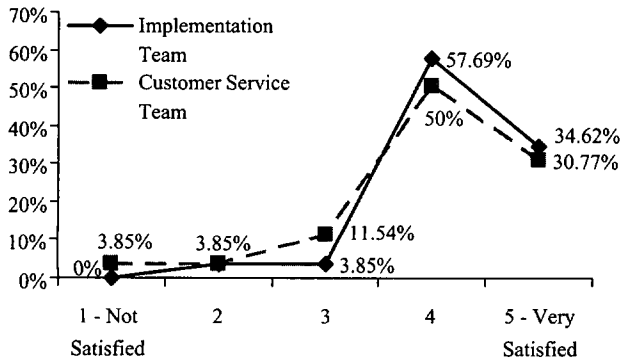
When asked about benefits experienced, twenty-one (21) respondents reported positive feedback from both internal and external ILS users, e.g. new products, enhanced patron empowerment features, increased OPAC use and customization, improved technical services workflow and functions, as well as ability to share resources. Several respondents also stated that it was a good learning experience to be involved with the migration process.

Respondents were also asked to rate their overall satisfaction with the vendor implementation team and customer service team. Ratings were conducted on a scale of 1 to 5, 1 being "Not Satisfied" and 5 being "Very Satisfied" (Fig. 5). The ratings reveal that an overwhelming majority are satisfied with the vendor implementation team. Similarly, the majority of respondents are satisfied with the vendor customer service team.

Open Source ILS

So how did these respondents feel about open source ILS? Only 5 out of 26 (19.23%) reported they considered an open source ILS. Two of the five chose Koha; one was considering it; and two indicated they were keeping the option open—even though one elaborated that they were not serious at this stage due to the cost and the daunting tasks of development. The remaining 80.77% of the respondents revealed they had not considered an open source ILS. Many respondents stated they lack enough technical staff. Some indicated that they were unsure about the quality and stability of open source integrated library systems, that the decision was made by the consortium, or that the timing was not right; others were monitoring open source ILS development.

Figure 5
Satisfaction with the Vendor Implementation Team and Customer Service Team ($n = 26$).



"Only 5 out of 26 (19.23%) reported they considered an open source ILS."

Web 2.0/Library 2.0

When asked whether their libraries had implemented any Web 2.0 or Library 2.0 projects on the ILS platform, only 6 out of 26 (23.08%) answered "Yes." In particular, three of the six listed Encore (a federated searching product from Innovative Interface, Inc.) and one reported that they implemented RSS feeds. The remaining 20 respondents (76.92%) reported they did not implement Web 2.0 or Library 2.0 projects on the ILS platform, even though several of them indicated an interest in doing so. Some respondents listed a lack of sufficient technical staff and time to implement such projects. Others indicated "lack of interest," "not in the position to implement," and "not necessary."

The respondents were also asked to comment on plans for future development. The following were some products they would like to implement: federated searching, discovery tools, Web 2.0/Library 2.0, digital management and digitization, adding more modules and other products such as OpenURL link resolvers. Several respondents reported that they were thinking about possibilities and had no immediate plans.

Lessons Learned and Advice

The survey asked respondents to list the top five (5) lessons learned from their ILS migration experience. The results, derived from 81 entries given by 22 respondents, were: 1) Staff and User Involvement, 2) Planning and Preparation, 3) Training, 4) Site Visits and References, and 5) Project Management. Respondents also commented that "no system is perfect" and warned others not to "believe everything said by the vendor's sales team."

"...the top five (5) lessons learned from their ILS migration experience. The results, derived from 81 entries given by 22 respondents, were: 1) Staff and User Involvement, 2) Planning and Preparation, 3) Training, 4) Site Visits and References, and 5) Project Management."

The survey asked respondents to give advice for other academic libraries considering an ILS migration

Table 9

Advice for Other Academic Libraries Considering an ILS Migration.

1) Allow plenty of time
2) Careful analysis of the migration data and coding of the data
3) Consider priorities and stability of each vendor
4) Evaluate all options and consider future needs
5) Spend time researching and obtaining references
6) Be prepared for staff resistance to change and provide ample training
7) Don't expect the vendor to tell you all the problems
8) Not everything with the new system will be perfect
9) Consider open source ILS
10) Listen to Marshall Breeding

project. Library administrators and key migration personnel from these 33 academic libraries and consortia provided the following first-hand comments for those considering an ILS migration project. Some of the comments are listed in Table 9.

Additional Discussion

The 33 academic libraries and consortia that responded to the ILS migration survey shared experience and insight from key personnel responsible for their migration projects. Following are some of their key observations:

- The most common selectors were committees and task forces.
- The majority of libraries surveyed took 6 to 12 months to complete the migration project.
- Overall, the respondents were satisfied with the vendor implementation and customer service teams.
- The majority of the respondents felt their expectations for the new ILS were met.
- Libraries implemented ILS and non-ILS add-ons to enhance user experience and improve resource management, such as federated searching, OpenURL link resolvers, discovery tools, and electronic resource management systems.
- Libraries surveyed expressed interests in implementing Web 2.0/Library 2.0 projects.
- Some libraries were part of a consortium and implemented union or shared catalogs for resource-sharing and cost savings; some respondents reported that certain migration decisions were made due to consortium requirements.
- The majority of libraries responding to this survey did not consider an open source ILS. Many felt uncertain about the open source ILS in an academic environment. In addition, respondents reported not having enough in-house technical personnel to support an open source ILS. Some expressed an interest in the concept and reported that they intended to monitor its development.

Following are some comments and suggestions shared by the respondents:

- No ILS is perfect.
- You gain some, you lose some. Just as a new ILS may provide features one likes, one may also lose certain features of the old ILS.
- Be prepared for staff resistance; it is critical to provide sufficient training.
- Don't expect vendor sales team to reveal all the problems.
- Ask serious questions of ILS vendors before making major decisions.
- Obtain references from other institutions and conduct research before a decision is made.
- Keep all of your options open.

Shared Catalog

Library consortia support their member institutions' needs, including the need for shared catalogs. Preece stated, in 2001, that some consortia "opted to aggregate their catalogs as union or virtual catalogs" to support resource sharing and minimize costs of personnel and materials.[55] Breeding observed, in 2004: "a strong trend toward shared systems, whether through large multi-library systems, consortia, or ASP implementations... [A]s libraries face increasing pressures on their budgets, fewer have the luxury of operating stand-alone automation systems."[56] This study of 63 libraries and consortia also reveals a continued interest among libraries in geographic proximity or within the same organizational structure to share a union catalog hosted by one institution. For instance, fifteen (15) academic libraries from the Appalachian College Association (ACA) decided to have one shared catalog, hosted and administered by the Bowen Central Library of Appalachia. Similarly, eight (8) academic libraries from Partnership Among South Carolina Academic Libraries (PASCAL) consortium have implemented a union catalog.

ILS Add-Ons

"Though the development of the ILS itself has lagged behind," according to Breeding, "a bevy of other products has emerged to help librarians manage electronic resources."[57] These resources include OpenURL-based link resolvers, metasearch applications, electronic resource management tools, and digital library products. Integration of these resources may lead to more "cohesive and simple-to-understand interfaces" which will help libraries to compete with popular non-library interfaces, such as Google and Amazon.[58] According to Breeding's 2004 study of the ILS marketplace, as ILS sales to large academic libraries reached a market saturation point, more add-ons have been marketed to the libraries by ILS vendors in order to stay competitive.[59]

This study also revealed positive feedback from respondents regarding new tools and features which enhance the user experience; discovery tools such as AcquaBrowser have gained the attention of library users.

Traditional, Open Source and Next Generation ILS

This study discovered that even though libraries migrate to different vendors for various reasons, there is a striking similarity between the two linear representations of the satisfaction with vendors' implementation and customer service teams (Fig. 5). These ratings reveal that the majority of the library personnel surveyed are satisfied with vendors' support teams.

Coyle raises the question of how information should be retrieved and displayed by a comparison of card and online catalogs.[60] She also discusses two aspects of Library 2.0: the changing role of the library catalog in a Web 2.0 environment and the social networking nature of the library users.[61]

Academic libraries are evolving as their institutions respond to the challenges of implementing cutting-edge technologies. Blended or web-mediated teaching and learning are only some of the changes made by institutions of higher learning in addressing these challenges. Challenges can inspire innovation and provide insight for new opportunities.

Conclusion

The vendors included in this study represent the major ILS players in the library automation industry in the United States. The ILS migration projects considered here reflect the challenges and opportunities facing academic libraries and ILS vendors. New technologies change the way integrated library systems function and the way libraries conduct core business operations. This study of hundreds of press releases from the past four and a half years, as well as the survey results presented here, provided a snapshot and systematic analysis of these academic institutions involved in ILS migration projects. The survey respondents also provide first-hand information on the migration process: their expectations, selection mechanism, lessons learned, what did or did not work, and plans for future development.

The limitations of this study include the complexity and difficulty of data collection caused by mergers and acquisitions between major ILS vendors during the period of the study. The volatility of the academic library ILS market in the United States makes it challenging to compare ILS systems, including those originally from competing vendors now being offered by a single company. Some of the press releases were retrieved from the Library Technology Guides website, maintained by Marshall Breeding, as ILS companies maintain different policies regarding archived press releases via the Internet; after one company is purchased by another, its information, including press releases, often becomes unavailable.

The author chose vendors based upon size and number of library migration projects with which they were in contract, i.e., academic, public, special, and school libraries, domestic and international. This study features only U.S. academic libraries. The author plans to expand this project to include other types of libraries in the United States and beyond.

These mergers indicate the level of competition and uncertainty in the field of integrated library systems. In addition, ILS vendors are now encountering challenges from open source vendors. The major ILS companies compete to gain strategic positions in the domestic and global ILS markets.

This study provides a systematic approach to academic libraries and consortia with an ILS migration project in the United States. Survey results reveal that systems personnel and administrators take the selection process seriously. Nearly 75% of the 25 respondents reported that they spent six (6) to two (2) years to select a new integrated library system. Despite growing interests in open source ILS's, more than 80% of the 26 respondents in this study revealed that they had not consider an open source ILS. This study also demonstrates a continued interest among libraries to share a union catalog hosted by one institution. It is encouraging that an overwhelming majority are satisfied with the vendor implementation and customer service teams. Similarly, nearly 85% of the 26 respondents reported that their expectations had been met and twenty-one (21) positive feedback from internal and external users of the new system. In addition, respondents are enthusiastic about add-ons such as Discovery tools that enhance the user experience and look forward to more user-centered features as well as Web2.0/Library 2.0 technologies that appeal to today's sophisticated academic users.

Facing increased competition, both existing and new, libraries and ILS vendors must join forces to support the current and future library users. The identities of the library and the user need to be redefined. Questions for the future include:

- Who will be the library users of the future?
- What will the identity of the academic library be?
- What will the role of the academic library be in a blended learning environment?
- How will the academic library of the future support the ever-increasing quest for information and knowledge by the user?
- How will the academic library of the future compete with non-library information service providers such as Google and Amazon?
- How will the library and the vendors develop integrated library systems and other services to facilitate the retrieval of information to assist the user?

With challenges come opportunities. Today's users are familiar with online services provided by Google and Amazon. ILS vendors and library systems personnel need to rethink how integrated library systems function and how information can be retrieved and displayed to best appeal to users. Part of the user experience involves online connectivity, interactivity and social networking —all requiring major changes in the design and development of integrated library systems.

Libraries must examine their resources and services critically in order to support the transformation of higher education. Library administrators and systems personnel need to be aware of how students learn today in order to build systems that attract and support users. As users become increasingly sophisticated in the use of

Web 2.0 technologies and online course management systems, the next-generation ILS will need to be more user-centered. Academic libraries and ILS vendors must change with the times and find new identities in order to lead in a rapidly changing world of information and technology.

Appendix A. Supplementary Data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.acalib.2009.03.024.

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