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From Electronic Resources Management to Library Services Platforms

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Libraries have long been proponents of automation, but one area that remains a challenge is support for electronic resource management. With each step in the long history of library automation, expectations are that the next generation of technology will allow libraries to do work that has always been done, only faster. This chapter discusses how this expectation may in fact have been the reason behind the unrealized potential of electronic resource management system (ERMS), and may further challenge the success of libraries in moving to new library services platforms (LSPs). As libraries contemplate this next migration, library professionals must reflect on how new technologies, particularly in the area of cloud hosted services, may provide an opportunity to redefine the library's purpose and mission in a truly new way. Taking that opportunity will mean reclaiming the library's relevance with respect to its parent organization, rethinking and rebranding the services provided to library users, and most importantly ensuring that the services libraries provide to their communities are understood to be something needed and valued by that community.

Librarians and other library professionals been talking about the revolution of print to electronic resource migration in libraries for the last thirty years, with the murmur becoming more of a roar these last twenty years as the proliferation of digital data moved from CD-ROMs to the web, and then exploded in an ever expanding universe of resources that users understand to be directly available to them anytime, anyplace, and all seemingly "free." But while libraries have been so focused on managing the ever increasing number of tasks that migrating to electronic resource collections entails, as well as grappling with the crippling budgetary ramifications of an unsustainable rate of inflation for electronic journal content, something very important has been overlooked. This is not a revolution, but rather evolution.

The shift to managing electronic resources often happened in spite of, but more frequently in addition to, the traditional print workflows libraries continue to perpetuate in both support systems and organizational structures. Some libraries have implemented an ERMS along the way. Some have adapted the traditional ILS to manage electronic resources. Most have done a bit of both, along with a myriad of other stop gap and homegrown tools cobbled together to manage what is an unsustainable workflow given that more and more libraries spend the majority of their primary collections budgets on electronic resources. According to OCLC,¹ by the year 2020 80% of library expenditures will be for electronic resources, with the vast majority of libraries currently managing electronic resources using spreadsheets. Despite the many different iterations of organizational change libraries have tried in response to managing electronic resources, the technology needed to support electronic resource management always seems to fall short. There are those libraries that have embraced the move to a next-generation ILS, some more successfully than others. But the challenge here has never been just technological or structural. The final step in this evolutionary path is rethinking the type of services libraries have traditionally provided to users rather than simply the tools used to manage electronic, print, or any other kind of resource. Whether it's called a library management system, next-gen ILS, web scale management solution or library systems platform, perhaps the real indicator of how successful libraries will be in implementing this next step in the evolution of library automation is to understand what services are currently being provided to users, and why those should not necessarily be the same focus of the services provided to users in the future.

UNREALIZED POTENTIAL

A change in the environment always precipitates an evolutionary response. The evolution of the digital format as a vehicle for delivery of information was certainly a fundamental environmental shift, but it was not an instantaneous one. Combined with the relative ease with which users can access information through online search engines and purchase products online with a click, it should be no surprise that user expectations for library services have evolved. Students and faculty often remark that "If it's not online, I'm not interested" and "I don't understand why the library doesn't have it, I just found it online for free from Google." In order to meet that demand, library collections have become increasingly electronic, with workflows for managing electronic resources often in conflict with, or layered on top of, the work library staff have traditionally done to support print based materials.

With each iteration of new technology allowing library users more direct access to the information they seek without having to worry very much about the complicated processes by which

library staff ensure access to those resources, its often a shock to users (including many librarians and library administrators) to find that much of this process is still managed manually. Library staff are still what makes the difference between success and failure in terms of licensing, acquiring, cataloging, and maintaining reliable access to the libraries' online collections. The now famous diagram by Oliver Pesch (see figure 1)² demonstrates the dizzying array of new tasks in which library staff still need support, work that became exponentially more complex in skill level, and which ultimately varied greatly in terms of the level of system support this new workflow received in the electronic resource management system marketplace. So where did ERM systems go wrong, and why?

Figure 1

The Evolution of Standards

While no doubt the ERM Data Dictionary and workflow diagrams of the DLF ERMI 1³ & 2⁴ projects were the key factors in pushing both the professional understanding of the needs surrounding electronic resource management as well as the marketplace development of system support to meet those needs, one critical challenge the industry never overcame was the failure to adopt recognized formal standards based on them. Eager to get out ahead of their competitors, ERM system vendors labeled their products as "ERMI compliant" while attempting to be all things to all customers. When they found themselves unable to meet all of the specifications customers expected from their products, many marketplace vendors abandoned the development of ERM systems. Meanwhile libraries could no longer justify the difficulty of implementing (or maintaining) an incomplete product, or find the funding for another product after a failed ERM system experience.

The work done by Kasprowski in 2008 to map best practices to emerging ERM standards and identify the initiatives and organizations developing them finally gave the library world a sense of how to prioritize the many ERM data needs in a meaningful way using five distinct categories on which to focus in the future---1)Link Resolvers and Knowledge Bases, 2)The Work, Its Manifestations, and Access Points, 3) Integration of Usage and Cost-Related Data, 4) Coding License Terms and Defining Consensus, and 5) Data Exchange Using Institutional Identifiers .⁵ Four years later, the NISO ERM Data Standards and Best Practices Review Steering Committee summarized the work to date and expanded the recommendations for each of these areas, suggesting that the industry focus its efforts on "practical projects of narrower scope [that] will have more positive impact than would an expanded ERM Data Dictionary."⁶ Although some initiatives have fared more successfully than others in coalescing practices

in the field, many of those identified by Kasprowski and the Steering Committee are today easily recognized as standards by the industry (Open URL, KBART, DOI's, SERU, COUNTER, SUSHI, institutional identifiers such as the WorldCat Registry, Shibboleth).

The Qualified Success of ERM Systems

To the degree that ERM systems were successful however, a trend can be observed over time. Those standards and initiatives developed to address a specific focus of ERM need tended to be more successful than those systems that attempted to address everything all at once. An example of this is OCLC's automated holdings service, in which content providers send holdings information for a library's purchased content to OCLC, where that data is used to auto populate the WorldCat Knowledgebase for that customer based on their WorldCat Registry identifier, triggering setting the holdings in OCLC, and making resources instantly discoverable for library users. This is particularly useful for libraries who use this service for DDA selections, as titles can flow into the DDA pool and move to the purchased pool automatically with no intervention from library staff. Another trend that can be observed about the relative success of ERMS is that the libraries that were most successful in implementing an ERM system tended to be ones that were clear eyed about their local workflows in relation to their most pressing ERM needs **before** developing or implementing a system solution. An example of this is Notre Dame's development of CORAL, a system built foremost around the management of the licensing process and deliverables. The line between success and failure in each of these scenarios has one thing in common---a clear development of best practices with respect to ERM workflow and a solid understanding on the part of the library about where it sits within those best practices.

In a 2011 article on the results of their industry survey, Collins and Grogg described the state of ERM systems as "less like a silver bullet and more like a round of buckshot."⁷ There were many options available to libraries, but none of them would solve every ERM need a library had. In that survey, librarians and vendors identified the problem of workflow management as the area most in need of ERM support, followed in order of importance by license management, statistics management, administrative information storage, acquisitions functionality, and interoperability. Workflow support had indeed become the unfinished business of ERM.⁸ Despite the attempt documented in the workflow diagrams of the DLF ERMI 2 report, the library profession had not come to a common understanding about what ERM best practices should be, something that was equally as much to blame for the limited success of ERM systems as was the lack of system standards. Again and again, libraries found themselves in the situation of having purchased or developed an ERM system based on perceived needs, only to find that the system

they now had failed to address the most pressing needs of staff on the ground. In an attempt to address this gap, the TERMS project was developed by Jill Emery and Graham Stone in 2011.⁹ TERMS stands for “Techniques for electronic resource management,” and with its revival as Version 2.0, this good work will continue to help librarians address the core scope of services they need for ERM support before making decisions about a solution.¹⁰ With the further development of ERM functionality already present in existing discovery systems and anticipated in library service platforms, it’s clear that managing expectations about how a system will work in relation to the most pressing needs a library has for workflow support will continue to be the key to success.

COMBINING FORCES

In 2011 Collins and Grogg noted that despite being listed as sixth on librarians’ list of top ERM priorities, interoperability was really the lynchpin upon which all of the other ERM functionality librarians identified as needed would depend in the future.¹¹ They were not alone in noting the potential for new service-oriented architecture (SOA) to finally free ERM from the constraints of the traditional ILS, although as Dawes and Wang noted the new potential of this system architecture really depended on the willingness of libraries to re-examine their own internal workflows and let go of out-of-date practices in light of the new systems’ potential efficiencies.¹² The idea of creating integrated platforms from the ground up, combining the ILS data libraries still consider vital (purchase records, cost data, unique bibliographic data, circulation data) with knowledge bases (entitlements, holdings, discovery data) and the data libraries continue to manage rather awkwardly between ERM systems, spreadsheets and homegrown databases (licensing terms of use, usage statistics, administrative data) is definitely the goal of the next generation of ILS products. But as Wilson points out, this Holy Grail of interoperability is hardly a straight line and does come with some drawbacks as libraries chart a course for their own future, namely those surrounding the decisions libraries will need to make between the efficiencies of interoperability vs. the independence of local control.¹³

Some things libraries will need to consider moving forward are 1) the risk of consolidating systems service with a single marketplace vendor, 2) willingness to maintain data in different systems (back end vs. discovery being the biggest challenge here) in order to continue using products from multiple providers, 3) the shift in organizational culture and library workflow needed to accommodate agile development cycles, and 4) the sacrifice of local control and customization to benefit from the full potential of network level efficiencies. The decisions libraries make along the way for any of these areas will also not happen in a vacuum, but rather in a rapidly evolving library marketplace increasingly

dominated by large marketplace players consolidating services in a way that leaves many in the field uncomfortable and justifiably wary of how those mega providers will continue to work with, or against, each other.

From Separate Systems to Unified Architecture

At the heart of the move to “library services platforms” (LSP’s), a term Marshall Breeding coined which has now replaced the term “next generation ILS,” is the technology of Software as a Service (SaaS) and the potential of cloud computing to replace the traditional client/server model for IT. With SaaS, the customer is using a service which sits on a remotely hosted machine instead of software hosted on a local server. The benefit of SaaS is that updates to the system can happen more frequently, and require no assistance from library IT staff to implement them. Cloud computing is defined by the National Institute of Standards and Technology (NIST) as including the following functionalities: on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service.¹⁴ SaaS is only one of three service models for cloud computing, the other two being Platform as a Service (PaaS) and Infrastructure as a Service (IaaS), all of which can be deployed in a cloud that is private, community based, public, or in a hybrid model. All of this is to say that the different models are there, and have been for a few years now, but within the combination of these models are some decisions that libraries will have to make when considering what combination may be best for the library’s needs.

Carl Grant highlights two features libraries must factor into their procurement process and specifications.¹⁵ First is understanding the benefit of true multi-tenancy, which is one instance of the system in the cloud serving multiple customers at the same time. While a vendor might use an SaaS architecture to support their services, there is a great deal of difference in the efficiencies of using one image of that software to push out updates for 500 customers sitting on that same instance versus a vendor who is hosting 500 different instances of that same software and has to spend staff and time updating 500 separate instances with the same update. The other feature Grant recommends libraries include in their procurement specifications are compliance with standard security certifications, considering carefully the security risks to which cloud computing could expose library data. Grant has been a vocal critic of what some in the field see as a growing inequality in the library marketplace over the degree to which libraries who embrace true multi-tenancy systems will reap the full benefit of the aggregated services and more importantly, aggregated data collected at the cloud level, versus those libraries who won’t.¹⁶ Libraries that embrace true cloud computing and free their staff to develop analytics will be able to engage in assessment activities such as mining user data to link student use of

library services with higher GPA's and student retention versus students who don't use the library's resources, or link researchers' use of library services with the success of grants bringing external funding to campus. For anyone who might have missed the last thirty years of academic libraries reacting to funding cuts, these are precisely the proactive analytics that would finally show campus administrators that libraries are not the "cost center" of old but rather the true revenue generators for the entire campus.

Evolution in the Library Marketplace Landscape

As seen with the qualified success of those libraries who implemented an ERMS, many libraries continue to use them, and likely will until another system solution provides more completely for the ERM needs currently being met in them. Given the much longer history of integrated library systems and the wealth of data that libraries continue to manage in them, it's probably not surprising that libraries will continue to use them for some time to come. Despite the growing maturity of those library services platforms that have reached the marketplace, traditional integrated library system vendors are not simply going to abandon their products, and it's likely there will be a number of simultaneous approaches in the marketplace for some time. Grant neatly summarizes these approaches as 1) starting over, 2) evolutionary, and 3) open.¹⁷

Starting over are products like OCLC's WorldShare Management Services, ExLibris' Alma, and the now defunct Intota by Serial Solutions. These systems start with a new design from the ground up, breaking from the past functionality of traditional integrated library systems and are generally agreed to be true library services platforms. Traditional integrated library system vendors are pursuing an evolutionary approach, exemplified by products like Innovative's Sierra and SirsiDynix' use of BLUEcloud to deploy new interfaces and functional modules to its existing Symphony and Horizon customers, re-utilizing their more recent generation of products and layering those with new technology to expand the products' functionality. And lastly, open systems such the now defunct Kuali OLE (Open Library Environment), rebranded as FOLIO (The Future of Libraries is Open) with Ebsco's more active partnership, seems to chart a path that is a bit of building from the ground up while also embracing an evolutionary path.

Since the emergence of the library services platform, the library industry has also seen business mergers that are increasingly blurring the lines between traditional integrated library system vendors, book and serial vendors, and content providers. ProQuest's acquisition of EBL/Ebrary, Serial Solutions,

Coutts, and ExLibris is one example of this, as is Ebsco's acquisition of YBP Services and the lead role they now play in FOLIO. As Marshall Breeding noted in his latest Library Systems Report for American Libraries, one effect of these kinds of mergers is the likely trend away from standalone ILS companies, who will simply not have the resources to compete in a marketplace dominated by such multi-headed giants.¹⁸ Additionally, with these mergers there is now another contrast in the LSP development approach as exemplified in the two new super companies; whether or not discovery will be (re)bundled with resource management or remain interchangeable should the library choose an alternative company for an LSP.

THE PROBLEM OF TRANSITION

As one might expect from the variation in approaches present in the development of library services platforms against a marketplace increasingly defined by rapid business consolidation, there is also a growing sense of apprehension about which direction to pursue. Some libraries are understandably hesitant to commit too fully to any one product, while simultaneously recognizing that the longtime pursuit of best of breed products to support ERM work is unsustainable given the potential of true cloud computing solutions to free up staff from otherwise redundantly updating multiple systems with the same information. This is especially true if libraries do not accurately assess the risks of waiting too long for the market to mature, staying with legacy tools longer than they should and falling behind in terms of their inability to leverage new technologies to more easily manage and assess their electronic collections. There are certainly risks and rewards with each development approach. As with the ERM system development trends, the degree to which a library understands these risks and rewards in relation to its own resource management needs and organizational aptitude for change will be the single most important condition for success.

Finding the Right Fit

So, what is it that libraries need to know about themselves in relation to different LSP development approaches and the volatility of the library marketplace? Below are some scenarios capturing what each path looks like in terms of the organizational culture, aptitude for change, and risk tolerance for a library that might match each LSP development approach.

Ground Up Library Services Platform

While libraries who pursue this approach will ultimately benefit from true multi-tenancy in that they will no longer have to expend IT staff resources updating systems that were previously hosted on local servers, there are some trade-offs for that efficiency. Because these systems are ground up and still developing while in production, they are not fully formed when released into the marketplace. Meaning they are unlikely to be a system that can address multiple competing needs within the broader marketplace of libraries until some time has passed and they further mature. Often lacking needed functionality in the early phases of development, libraries who are early adopters of these systems must match their greatest needs with those solutions being prioritized for early development. Matching the library's greatest needs with those functionalities prioritized in early development is crucial. One good way to do that is to become a development partner, ensuring that the vendor will focus on your library's needs as the segment of the library marketplace they wish to serve first. And even then, something to keep in mind for libraries pursuing this path is the need to continually assess staff resources in relation to workflow. Cloud hosted solutions, particularly those that are true multi-tenancy, will not have the options for customization that locally hosted and developed systems did. This means there **will be** a moment (or many) when the library will have to confront its own legacy workflows in relation to how far away they are from those best practices now becoming expected standards of the profession and the marketplace.

Evolutionary Integrated Library System

Libraries that pursue this approach are not yet ready to leap to the risks of being on the cutting edge of innovation, and don't yet see enough gains in revolutionizing their workflow versus the staff and financial costs expended to get there. For library staff and library users accustomed to system interfaces they know well and that have served them admirably for a long time, the need for change is not yet apparent. The costs of moving too quickly into something that doesn't work well, or a product that fails, is simply too risky. For many library administrators, the risk of upsetting their user community by upending the library's reputation as a steady community resource is too great. Instead they will defer the efficiencies gained from cloud computing services until later, choosing to continue expending staff resources to support systems that risk falling further behind, and that continue to force redundancies on ERM staff who must continue focusing on work that is rapidly become automated in cloud computing library service platforms. The real risk here is waiting too long and being left behind. If many other libraries have moved to LSP's and successfully develop new services with data and staff resources they now have more readily available to them, then the libraries who don't make this transition quickly

enough will suffer by comparison. Academic libraries already see this. Faculty members who come from other academic environments typically have expectations for the library's services based directly on their experience with libraries at other institutions, and they are not shy about letting the library know when they find something deficient.

Open System

The key thing any library pursuing an open system development needs to understand is how their staff resources relate to the scope of the development. If a library has limited IT staff to help develop a community sourced product, or support it after implementation if not a true multi-tenancy cloud hosted system, then this is likely not the best option to pursue. Additionally, even if a library has IT programmers to spare, does it have the functional staff to support the testing and further development cycles before the system goes into production, or even afterwards? And since building from the ground up often means being unable to address all functionality needed at the same time, a library that embraces this direction has to understand that needed functionality may not be there at the time of implementation and staff will likely need to duplicate their work by investing in home grown solutions or continuing to use other systems in order to support those areas not yet being served. Additionally, libraries need to consider other financial costs. Using the now defunct Kuali OLE as an example, if the development work is initially funded by membership fees and/or limited grant funding, this model may not scale, as libraries with already limited resources may be unable to invest either money or staff time in a project that may ultimately advance too slowly to achieve market buy in after commercial products have already matured in the marketplace.

Some Additional Concerns

Given the consolidation in the marketplace between different sectors of the library business, the issue of content neutrality may weigh heavily in library decisions and risk assessment. With consolidation at the product, fulfillment, and system level, there are serious concerns about the lack of content neutrality. If a vendor is simultaneously a library's vendor for product, supply, and system support for both resource management and discovery, this could be a problem should the library find fault with one area in this suite of services and wish to introduce a competitor for that area. That kind of consolidation in the industry makes libraries very nervous, particularly given the experiences they have had with consolidation in the journal publishing industry and the subsequent increase in costs that monopolies tend to generate. There is also a fair amount of skepticism in the library world about the

altruistic role of the last remaining large content neutral provider, OCLC. Yet, at least there, libraries do have direct input given that the basis for that organization is to act on behalf of its membership, and libraries that wish to make the most of that influence do have opportunities to provide it. Which brings us to the opposite end of the spectrum; businesses controlled through equity ownership. We have seen the devastation that equity ownership and the need for shareholder profits have done to long time and trusted library marketplace suppliers. What's to stop a large super-services vendor from being acquired by an equity investor, reducing its research and development capabilities and refocusing its priorities as it now works to send much of its profit to its new parent company? What happens if the stress of that is too much for the company and it goes under? A library pursuing an all-in super vendor LSP may want to consider creating a disaster plan should that vendor go under and the library simultaneously risk the loss of its main source of support for both acquiring collections and managing them.

The Assessment and Selection Process

Aside from being aware of the traits each library services platform development path might require, libraries need to make this decision using real data and real methodologies. Luckily, there are models out there. The importance of approaching vendor selection through the lens of a sound environmental scan, needs assessment, and cost benefit analysis cannot be overstated here. It's also important to do all of these things within a formal Request for Proposal (RFP) process in which detailing the scope of service and functionality expected can go a long way toward eliminating the shock of realizing the system for which the library has contracted does not in fact serve the majority of the library's needs. There are a couple of core factors to keep in mind here.

The first factor in considering a move to an LSP is assessing whether or not there is a consensus on the need for change. Conversations with stakeholders need to happen early. Along with an honest assessment of what library users want, and what these new systems are likely to provide them. Talk to other libraries that have already implemented an LSP and find out what the advantages and hurdles were for them. Talk to colleagues in other parts of the library or campus environment about what systems they use and whether it would be beneficial for their work were it easier to connect to an LSP, or if an LSP were to replace their current system. Talk to colleagues in your consortia about what common needs you might have that could be directed into a structured discussion about how to move as a group to identify solutions to those needs.

The second factor to consider is the complexity of the current system ecosystem in which libraries exist. Today libraries are likely to employ systems to manage print (ILS and OPAC), to share print (ILL and union catalogs), an institutional repository (IR), an ERM system for managing licenses or calculating usage statistics, link resolvers, knowledge bases and proxy servers to manage electronic resources, discovery systems, and content management systems for supporting electronic resources. Add on to this any collection assessment tools libraries are using. As Forsman notes, this complex environment requires that libraries looking to move to an LSP map their own current systems landscape, noting the dependencies of each, and especially paying attention to those areas in which the systems used work together **only** because of the people employed to make connections between systems that otherwise are not interoperable.¹⁹ For Gallagher, it's also very important that libraries consider a variety of options for migration, first taking note of whether or not they have the financial or human resources to make the shift to an LSP, and second by employing a cost benefit analysis to identify areas where cost savings will become greater over time and after the initial investment in migration.²⁰ Having a solid understanding of the financial processes involved in your institution's procurement process is an absolute must, as is understanding what university systems need to be considered when integrating an LSP into the university's payment operations, and identifying stakeholders in other parts of the library impacted by the move to an LSP are all important. Doing market research, keeping up with the rapid changes in products and players, and requesting demos all help with the decision making process. Additionally, it's important to collect feedback from stakeholders for any demos done, especially since those who don't normally work directly with managing library resources may have insights that haven't been considered, or concerns that might otherwise be overlooked.

Early Adopters

For those libraries considering the leap to a library services platform vendor, it can be enlightening to hear from real libraries who've already made this move. **Bucknell University** was one of the first libraries to implement OCLC's WorldShare Management Services.²¹ In responding to the offer from OCLC to become an early adopter, Bucknell performed a cost benefit analysis working with its Vice President for Library and Information Technology.²² Since the libraries shares IT support with the campus, this was one of its most vital stakeholders. While Bucknell is the largest liberal arts university in the U.S., with 3,400 undergraduate and 150 graduate students, the campus size and the library size are very small compared to the large Association of Research Libraries (ARL) of other major universities in

the US. For a small library looking to save staff time in relation to system costs, an LSP might be the best solution.

Even though Bucknell may be small, many of the efficiencies they hoped to achieve with the move to WMS are certainly the same ones that drive much of the decision making in larger campus and library environments---1) reductions in staff, especially staff in technical services and IT, make it difficult to continue maintenance and upkeep of legacy systems or legacy system workflows, and 2) an increase in costs as different systems for managing library resources have to be layered on top of one another to achieve different aims with respect to resource management or discovery, and 3) a desperate need to provide more patron driven services to library users who expect to have resources available to them at the point of need and are not happy with waiting for the library to acquire those materials through traditional acquisition purchasing models. Looking at a couple of other libraries that have made the transition to WMS, this same scenario seems to be the impetus for change and the benefit most cited. In addition to the cost savings of no longer locally hosting an ILS or spending staff time maintaining that system, the **University of Nebraska Omaha Library** cited saving staff time in cataloging and e-resource management as successes of their move to WMS. Cataloging, acquisitions, and ERM staff benefited from direct updates to the KB through OCLC's automated metadata processes, using publisher and vendor data for library purchases to automatically update the library's KB, which then triggered updating the holdings in OCLC and making the resource instantly accessible for library users through the library's WorldShare Discovery catalog.²³ While there are certainly distinct benefits to the automated efficiencies experienced by Bucknell and University of Nebraska Omaha, there are also clear tradeoffs for larger libraries when it comes to this same product. As Bordeianu and Kohl detail, the **University of New Mexico Libraries** experienced some significant adjustment in workflows after they migrated to WMS as part of the broader 17 member LIBROS consortium.²⁴ Although UNM Libraries noted the same benefits of staff savings in both IT and cataloging, the lack of needed functionality in other areas such as Acquisitions was hard to overcome. Additionally, the libraries' staff had to adjust to the fact that twinned with the WorldShare Discovery interface, any problems with electronic resources were much more visible to users when something in the resource chain had gone wrong, and addressing those problems in real time with users who were unhappy without an immediate fix was a struggle.

Sharing IT Support: A Contrast in Consortia

Libraries have a long history of sharing IT support within consortia, the aim of which has historically been the cost savings of group purchasing for at least the system itself in terms of the

software and maintenance, but sometimes also the hardware and the IT staff who support the system if centrally located for all member libraries. The primary reasons why many libraries formed consortia were a desire to form union catalogs and sharing bibliographic data in order to streamline searching and borrowing between member libraries. In the case of consortia in which libraries share a single administrative instance of their system, sharing bibliographic data can also benefit the functions within acquisitions and cataloging as libraries can use the same records for both setting up orders and holdings within the ILS. Given the variety, history, and degree of cooperation amongst different consortia models, the complexity in this area of the library marketplace is proving to be one of the most challenging for library services platform providers to develop. That said, an analysis of three different consortia, the history and structure of their cooperation, and the decisions they have since made about LSP's might shed some light for other groups wondering how to navigate this next group decision.

PALNI

The Private Academic Library Network of Indiana (PALNI) is a consortium made up of twenty-three private academic institutions across Indiana. With a range in FTE size from 50-5000, the consortium is primarily made up of small to medium sized colleges and universities with a primary focus on undergraduate education. Given the relative size of the schools in relation to each other, and their history as private institutions, it is perhaps not surprising that their cooperative relationship has a long history of deep collaboration. The PALNI website presents some wonderfully informative information about the group, detailing the members, governance, organization, mission, strategic plan, as well as the history of the group.²⁵ PALNI's origin was a successful Lilly Endowment grant during the 1980's to create a union catalog among the private academic institutions of Indiana, an endeavor that led to the creation of the State University Library Automation Network (SULAN). By 1990, what would become the PALNI libraries agreed they needed to form their own independent college library resource-sharing network rather than risk losing out to the priorities of much larger libraries in a state university-dominated system. After receiving IRS non-profit status in 1992, the group officially moved forward as PALNI with their first online library automated system in 1994. With the help of another Lilly Endowment, the group contracted for its first integrated library system with ExLibris, and by 2004 had bundled the full suite of ExLibris' ILS and ERM related products including Aleph, Metalib, and SFX. By 2010, a number of factors led the group to consider even deeper collaboration with each other, including expanding beyond a shared union catalog and a cooperative contract for an ILS. Two key

decisions were made that likely contributed to the later course of action the group would take for a group library services platform.

The first decision PALNI made was contracting with ExLibris for Primo Total Care (the vendor's fully hosted cloud service discovery layer), a decision that meant PALNI libraries were making a conscious decision to move away from the model of individually hosted systems. The factors leading to that decision and the process by which they selected the product are well documented.²⁶ But it's the subsequent post migration piece by the same authors a year later highlights many of the challenges they'd faced with respect to moving to a hosted service and that would no doubt later influence the LSP decision.²⁷ In migrating to Primo, PALNI libraries discovered divergent workflow practices between different libraries which had resulted in divergent implementations and use of Aleph over many years. These differences had to be normalized, and the libraries reported a lot of data cleanup was necessary in order to ensure the data fed into the new shared discovery layer would be consistent. Additionally, the libraries experienced the same pushback from librarians and users with respect to the Primo interface, resulting in only five of the libraries implementing it as their primary default search interface, and beginning a much deeper conversation about how well the interface met or did not meet user expectations.

The second decision that would act as a catalyst for the group's move to an LSP was hiring staff for a centralized office. In 2010, an Executive Director was hired to oversee the operations of the consortium, along with a Digital Communications Manager to help them communicate effectively with each other, brand and market their services, and assist with usability and user experience studies. By 2011, PALNI was clearly struggling with the Primo decision, and decided to create two part time coordinator positions to help with resolving some of the internal data problems they'd encountered. A Systems Coordinator and a Cataloging Coordinator were drawn from existing library staff and would continue to be employed by their home institutions, but would spend half their time working for PALNI. No doubt the experience of standardizing workflows across previously independent technical services staffs contributed greatly to the libraries 2013 decision to contract with OCLC for WorldShare Management Services (WMS). Given the efficiencies documented above by the libraries above who also implement WMS, this was a solid choice for a group of smaller libraries who did not have large technical services staffs, and would be looking to redirect local IT staff toward other institutional priorities. Since the decision to go with WMS, PALNI phased out the two part time member library personnel positions and have now added four additional full time central office positions---an Assistant Director, a

Knowledge Base/License Manager Librarian, and Office Administrator, and a Scholarly Communications/Open Access Librarian.

Orbis Cascade Alliance

The Orbis Cascade Alliance is a consortium of thirty-seven academic libraries across the states of Oregon, Washington and Idaho. The current consortium was formed from the merger of two previously separate consortia in 2003---Orbis and Cascade. Resource sharing has long been a key trait of the group, particularly for the former Orbis consortium, and is what led both consortia to merge and then migrate to a single instance of Innovative's INN-Reach union catalog and interlibrary loan system used in tandem with each library's independent implementation of Innovative.²⁸ Following a contractual dispute with Innovative, and heeding a desire to further explore efficiencies in resource sharing beyond their own membership, the Alliance decided to explore an initiative in 2008 with OCLC to implement a resource sharing union catalog called Summit which prioritized the member libraries' holdings in WorldCat and better facilitated circulation transactions within each member libraries' ILS operations. The Alliance was also interested in OCLC's next-generation ILS development leading to what would eventually become WorldShare Management Services (WMS).

By 2010, the consortia members were beginning to think more deeply about even further collaboration, believing that it would be beneficial to the group if they pushed collaboration beyond public services and began building shared technical services, including collection development, vendor files, serials holdings information, and electronic resource licenses.²⁹ They had also done an assessment of ILS costs among each of their members, itemizing software, hardware, and local staff support costs, which later was the foundation against which they could calculate the cost benefit of migrating to a hosted LSP. The Alliance was also unhappy with what they had found with OCLC's developing WMS product. Specifically they were concerned about the data security of moving user data and other sensitive information to a vendor-hosted system, and they were frustrated with the methods then in place for migrating library holdings data into WMS, a process that many of the members felt placed too much of a burden on member libraries.³⁰

After an exhaustive RFI and subsequent RFP, the Alliance announced in 2012 they had selected ExLibris' Alma with Primo for their shared LSP and Discovery solution. This meant a shift in workflow and systems for many members. At the time of migration, the Alliance members would move from three different integrated library systems and four different discovery platforms. The libraries' parent

campuses range in size from small colleges with 1000 FTE to major research universities with 45,000 FTE. The likelihood of common workflows and best practices among libraries with that degree of campus differentiation may be difficult to find. Add to this the Alliance members' long history of independently hosted systems, meaning a certain level of customization in workflow support for each library was possible. Fu and Carmen document some of the challenges the member libraries went through in cleaning up their ILS data in preparation for migration, as well as resolving issue post migration, highlighting the communication and leadership necessary for key personnel responsible for the bulk of any member libraries' migration efforts.³¹ In fact, Stewart and Morrison cite coordination between consortium members as one of the primary challenges of the Alliance's migration, as library staff had to learn to design workflows in coordination with staff in other libraries while at the same time grappling with the perpetual beta of a system still in development.³² The largest of the Alliance Libraries, the University of Washington Libraries, were surprised to find Alma lacked basic acquisitions functionality such as templates for ordering and did not yet have an ERM module. In this respect, the experiences of libraries implementing Alma were no different than those cited above who have implemented WMS.

USMAI

The University System of Maryland and Affiliated Institutions (USMAI) is a 17 member library group representing primarily those colleges and universities that receive state funding for higher education through the University System of Maryland (USM). The group represents institutions ranging in size from small colleges to a large research university with an FTE of 36,000. It also includes great variation in institutional focus, including specialized libraries for health sciences, law, a center for environmental sciences, and a university specializing in distance education and online degrees. Additionally, the group includes a semi-independent campus offering degrees and classes using a mix of resources and faculty from nine of the Maryland public universities. Starting in 1982, four of the state universities began a cooperative contract for a shared Library Information Management System (LIMS). After the state system name change to the University System of Maryland (USM) in 1997, the consortium re-chartered to form The University System of Maryland Library Information Management System. By 2000, the group included two additional state universities and colleges not formally part of the USM, and became the University System of Maryland and Affiliated Institutions (USMAI). In 2003, the USMAI embarked on its third cooperatively purchased library system, migrating to ExLibris' Aleph, and expanded this to include the ERM tools SFX and Metalib. By 2012, the group had also investigated a

hosted version of SFX, but could not reconcile the lack of local control and loss of customization with the potential IT efficiencies offered by a hosted service.

Unlike other consortia, the USMAI has a long history of centralized computing services. The staff who manage the ILS and ERM tools are housed at the State's Flagship University at College Park. With the migration to Aleph, the group decided it would implement the system on a single administrative instance shared by all member libraries. As a result of this uniquely centralized system, the group's resource sharing decisions often went beyond agreements on lending and borrowing, but further into developing best practices for sharing bibliographic records in core technical services areas for cataloging and acquisitions. What this relationship yielded over many years was a more or less constant awareness of how far any one library could stray from the centralized standard, and a comfort level with systems and interfaces that had benefitted from many years of customization provided that all members agreed to the changes needed. At times, the relationship was difficult should any library's needs become too far outside the norm of the IT support needed for the rest of the members. As documented by England and Lowe, the USMAI also has a long practice of cooperative electronic resource purchasing, something the consortia began in the late 1990's.³³ The USMAI model here was no different than with its ILS support. The consortium had never become an independent legal entity, nor had it applied for IRS non-profit status. Instead the group functioned as a buyer's club, paying part of the salary of a licensing librarian housed with the IT staff at College Park who was expected to split her time between College Park and USMAI. This same librarian was also negotiating on behalf of the larger Maryland Digital Library (MDL) representing 54 libraries across the State of Maryland and of which USMAI was also a part. With the Great Recession of 2008 and the retirement of the licensing librarian, both USMAI and MDL had to work together to find an alternative support model after College Park was told by its own campus administration that the vacant licensing librarian position would not be filled due to an indefinite hiring freeze.

Around this same time, USMAI was in the process of deciding on a discovery system to layer on top of the traditional shared Aleph catalog. While the majority of the libraries ultimately settled on implementing Ebsco's Discovery Service (EDS), College Park decided to commit to OCLC's WorldCat Local, eventually fully implementing the WorldCat Knowledge Base, and migrating to the OCLC link resolver and WorldCat Discovery Services interface. Although moving to a discovery layer was challenging for all of the USMAI libraries, the largest challenges remained migrating data initially into the interface, continuing to maintain multiple knowledge bases for the same e-resource content, and

struggling with user and librarian expectations for what a discovery interface should be. In the case of College Park, the decision to make use of OCLC's new automated metadata processes saved significant acquisitions and cataloging staff time as eBook resources for both purchases and DDA selections could be activated in the KB, holdings updated in OCLC, and instantly visible to users through the discovery catalog. This efficiency led College Park to discontinue exporting full copy cataloging records in the local Aleph catalog for eBooks after moving to WorldCat as its new public facing interface for users. College Park, as with other libraries, continues to experience the struggle between weighing the value of new efficiencies versus the challenge of missing functionality and uneven development cycles.

By 2010, the flagship university at College Park had decided to implement Quali Financials as its next campus financial system, leading the Libraries to decide it should become a founding member of the nascent Quali OLE development. This decision meant another disconnect for College Park, who would potentially implement the OLE system independently of USMAI. By 2013, USMAI decided to move forward with a Request for Information (RFI) to explore marketplace ready options that would support the needs of the consortia as a group, and were willing to consider Quali OLE. However, the result of the RFI proved that all of the systems of possible interest to the group were too early in their development cycle, and none had yet developed the kind of consortia resource sharing and ERM functionality that the USMAI group had hoped to find. Given the findings, USMAI decided not to move forward with a formal Request for Proposal (RFP) to entertain contractual bids from LSP providers, and instead decided to extend its contract a while longer with ExLibris for Aleph. Although the USMAI Council of Library Directors (CLD) approved a 2015 proposal to allow the centrally located systems librarians at College Park to spend a percentage of their time participating in hands-on testing and evaluation of the Quali OLE software, they were not allowed to participate fully in the development of the system. There was also great concern expressed at this time by the functional experts in cataloging, acquisitions, and circulation about the degree to which the OLE development seemed to focus on print management, a focus that College Park staff felt was not a good fit given that nearly 80% of the yearly collections expenditures were for e-only resources. After another environmental scan in late 2015 yielded no additional prospects, USMAI agreed to six-month intervals between revisiting this decision, only to decide in late 2016 that it would indefinitely delay any procurement actions on a next-generation system in order to wait for the products in the marketplace to mature fully. Meanwhile, after the demise of Quali OLE, College Park has decided not to participate in the new open source development, FOLIO, led by Ebsco.

Given the degree to which this group of libraries was accustomed to centralized computing services, the OLE development might have seemed a good choice since it would have potentially offered the flexibility of open source product development without the loss of local control and customization that are typically seen in cloud hosted LSP's. But even then OLE might not have been a long term solution in the sense that it would be locally hosted, and continue to require the libraries to invest in local IT programming and staff. After the demise of OLE, the USMAI decision to wait for further development of consortia functionality in commercial products is certainly worthwhile, but waiting has its downsides too. First is the potential for the USMAI libraries to be left behind when compared to other libraries who have already implemented LSP's. As seen with the libraries who have made this move, the migration does involve significant rethinking of local practices and workflows. One effect of delaying is that the USMAI libraries will not have a chance to influence the direction of the marketplace and systems providers for what eventually will become industry best practices and new standards. Another result of waiting is the libraries will miss out on opportunities to redeploy staff to other organizational priorities, delaying further the potential for successfully translating their value in the parent organization into additional funding opportunities and new library services.

LOOKING AHEAD: ONGOING CHALLENGES AND OPPORTUNITIES

While it is true that transitioning from integrated library systems to library services platforms has a great deal of potential to solve some of the more vexing problems libraries continue to face in managing electronic resources, there is so much more potential for opportunities to be gained here than merely a better way to manage resources. Finding the right fit, and charting a course that makes sense culturally and organizationally is vital for the success of any library in this new marketplace. While not implementing an LSP is an option, it also introduces some risk in allowing legacy workflows to dictate a library's future, and limit its potential for developing new services. Learning from the hard lessons of the ERM system developments, and particularly confronting the profession's own responsibility for the lack of standards and best practices that led to stalling efforts in that area is a must. If libraries manage the transition to library services platforms more reflectively, more consciously aware of the need for standard practices and normalizing local workflows, there is a very good chance that the library profession may benefit from the opportunities to solve the much larger relevancy and funding problems that plague libraries.

The Power of Time

While not always completely accurate, the predictive capabilities of Marshall Breeding have become somewhat legendary in the library technology field. In a paper based on a 2011 presentation made at the *IX Conferencia Internacional sobre Bibliotecas Universitarias* in Mexico, Breeding made a number of five year and fifteen year predictions about the future of library information technologies.³⁴ Many of his predictions for 2016 have come true, while others are clearly close to it. Library collections, particularly in the area of journal content, are almost exclusively electronic for many libraries. Very few have the wherewithal to continue duplicating content in print for journals, and most are becoming equally concerned about the “double dipping” of content published both in subscription models while unable to identify quickly or easily the duplicate versions of that same work available via open access initiatives. EBooks have certainly gained popularity among academic libraries, with many libraries who can no longer afford expensive print approval plans moving almost exclusively to demand driven acquisition models for book content in an effort to better target the specific needs of their users. Libraries have almost universally embraced and implemented new discovery systems, although the degree to which these systems and their interfaces meet the expectations of a broad market of libraries and users continues to be a debate not quite resolved. Library services platforms have entered the marketplace, disrupting in many ways the local understanding of workflows and the traditional development cycles that libraries were accustomed to from the more evolutionary approach of integrated library system development. And while locally hosted integrated library systems may be around for a while longer as the library marketplace makes this leap, it is true that the preference for locally managed servers for library systems is becoming the minority approach. Breeding expects LSP’s to reach full maturity by 2026, with most of the models based on open source software that is dominated by subscriptions to hosted services, and evaluated by the system’s quality of support, functionality, and relative power of application programming interfaces or API’s it offers.

Breeding notes the role that open high quality linked metadata and progress toward the semantic web will have on improving the user experience, which he hopes will be routine by 2026 and reduce the dependencies on commercial producers of both metadata and content. As documented by Antelman and Wilson, the role of projects like the global open knowledge base (GOKb) can immediately help libraries to identify duplication between content published in subscribed collections with the same content published in open access initiatives.³⁵ In many ways, their project to build a community sourced knowledgebase freely available to libraries, content providers, and metadata providers suffered from its association with the Kuali OLE project and the perception that it would be a competitor to the commercial KB and metadata providers in the marketplace. The reality is that embracing open linked

data systems can only improve the efficiencies for all marketplace players in that it would allow them to refocus their energies on developing support for the process of scholarly communication and education rather than simply managing the products of it.

The Power of Relevance

Libraries have an image problem. If perceived by the larger communities they serve as irrelevant, they continue to risk dwindling resources and an inability to shake the impression on the part of their funding organizations that they are cost centers rather than revenue generators. Organizations fund what they perceive to be of value. In response, it's not just the systems that help libraries manage electronic or other resources that must change. If the only outcome of the move to library services platforms is to enable libraries to manage the same resources, but faster, then the library profession will have squandered the opportunities this technological change could finally bring. Library missions must change, libraries must do a better job of identifying what their core services should be, and stop continuing services that are no longer core to their new mission. "For us to move forward in doing new things, we have to squeeze and extract from these peripheral services, the money, time, and people resources they currently consume and redirect them toward our core services. The 'core' is where we create differentiation and thus ultimately add value for our members and end users."³⁶ In discussing the future of library systems, Carl Grant believes the power of new library services platforms is the degree to which libraries can use them to reinvent themselves, remake their brand, and regain a reputation of relevance to the communities they serve.

For instance, libraries should be pushing library services platforms to focus on helping to provide a place for knowledge creation, not just discovery. Find a tool that makes information and data discoverable, yes, but then go one step further and provide a space for that user to recombine what they've found with other data to produce more sophisticated analyses, creating new works, and then seamlessly feeding that new scholarship into open access systems for review, publication, and dissemination. Libraries should deliberately disassociate from the image of themselves as warehouses for books, and instead find creative ways to reinvent space and stock them with systems and tools that routinely allow students and faculty to create rather than consume information.

Given the frequent discussions about the detrimental role that fake news has had on public discourse, there is no doubt a need for educating the general public in the skills necessary for critical thought, exposing them to opposing viewpoints, and making the environment in which knowledge is

made and who might fund or profit from it more transparent. Pushing library systems to include this kind of sophisticated context for data and information sources could make libraries the trusted resource for providing that kind of contextualizing service to the larger society.

Mining the aggregated data about library users, their needs, and their experiences could also be another potential success of library services platforms for libraries. Common in the business sector to justify the creation and funding of new services for customers, and to tailor services around unique customer markets, operationalizing user data is something libraries have been slow to embrace. As Murray, Ireland, and Hackathorn have shown, finding a concrete way to link student use of the library with student retention can do wonders for the library's image and funding opportunities because it taps into the same measures that university administrators use to define their own success when presenting the case for increased higher education funding to state legislatures.³⁷ In the library used in their study, the authors found that the use of the library's communication center had a positive correlation to student retention and directly translated that into a successful bid for additional funding for the center itself, a model that is now also being used for the library's writing center.

While libraries have long struggled with both the technological and organizational challenges of electronic resource management, the potential of new library services platforms to help them overcome these is so much more than just a better way of managing the resources. If libraries are to embrace the potential of new cloud computing technologies and LSP's, understanding how local workflow must give way to standardized efficiencies and capitalizing on the staffing surplus this could create, the possibilities for reinvention are only as limited as the will to try something new.

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