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When ERM Met Alma: The Intricacies of Content Management in a Shared Consortia Landscape

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WHEN ERM MET ALMA: THE INTRICACIES OF ELECTRONIC RESOURCE MANAGEMENT IN A SHARED CONSORTIA LANDSCAPE

INTRODUCTION

In 2013, after nearly two decades of operating in a distributed legacy Integrated Library System (ILS) environment on local servers, the Orbis Cascade Alliance (Alliance), a consortium of 37 public and private academic libraries in Washington, Oregon and Idaho, began a two-year-long process to migrate its members to a shared implementation of Ex Libris' cloud-based Alma Library Management System (LMS) and Primo discovery interface. This article discusses the challenges and benefits for electronic resource management when implementing a consortial cloud-based LMS, and explores whether one of the prominent next-generation (next-gen) LMS meets the needs for managing electronic resources at both the institutional and consortial level.

LITERATURE REVIEW

Most libraries are now using some form of electronic resource management (ERM) system to manage their electronic resources, be it a product purposely built for electronic resource management or a product adapted for use as an ERM. Much has been written on ERM functionality at the institution level. However, while there is some discussion of stand-alone ERM systems built specifically by or for consortia, little has been written on ERM functionality and workflows in a cloud-based next-gen system in a shared consortial environment. Medeiros et al. described a home-grown ERM database created by the Tri-College Consortium in the early days of electronic resource management (Medeiros, 2002). At

the 2008 ALA Annual Meeting of the ALCTS Electronic Resources Interest Group, Riggio presented some of the desirable features of a consortial ERM as well as the University of California's abortive efforts to implement a consortial ERM for the UC system (Riggio, 2008). Liu discussed the implementation of a consortial ERM by the Ontario Council of University Libraries, but that implementation was only for an ERM, not a cloud-based LMS (Liu, 2009). Aipperspach & Lapham discussed Serials Solutions' stand-alone 360 Resource Manager product which offers a consortium edition "to support academic consortia and multiple-tiered libraries" (Aipperspach, 2010). Nelson provided an in-depth look at the Colorado Alliance of Research Libraries' (CARL) Gold Rush ERM which, like 360 Resource Manager, is a stand-alone product (Nelson, 2010). Cukadar et al. described the efforts of the Anatolian University Libraries Consortium (ANKOS) in Turkey to develop a web-based, but again stand-alone ERM system for that consortium (Cukadar, 2015). The stand-alone CUFTS ERM (discussed by Taylor et al.) is built and maintained collaboratively, but was not specifically designed to support a consortium (Taylor, 2010). More recently, an article by Turner examined how four "academic library consortia are licensing and acquiring electronic books, databases, journals and streaming media" but did not focus on the ERM systems used by the four consortia to manage electronic resources (Turner, 2014).

BACKGROUND AND SUMMARY OF IMPLEMENTATION – WHY A SHARED SYSTEM?

The Alliance has its roots in Oregon's Orbis Union Catalog, launched in 1993, and Washington's Cascade Union Catalog, launched in 1996; by 2003, the two union catalogs had been merged into the Summit Catalog, a courier system had been established to share physical resources, and many electronic resources were being negotiated and/or purchased centrally. By 2007, the Alliance considered "the combined collections of member institutions as one collection" (Orbis Cascade Alliance, 2007). In 2011, a consortia-wide demand driven acquisitions (DDA) pilot was set up and a pilot project to share foreign

language cataloging was initiated. Although member libraries were increasingly interested in doing more collaborative and shared work, it became clear that making meaningful progress towards that goal would be difficult if member libraries were not only all using separate systems, but also all using multiple disparate systems to manage their resources. What was required was a “flexible platform capable of managing multiple types of library materials, multiple metadata formats, with appropriate workflows” (Breeding, 2015). In June 2013, the Alliance began to migrate its 37 member libraries to a shared implementation of the Alma LMS and Primo discovery interface. Migrating four cohorts of libraries every six months, the migration was completed in January 2015. In 2016, two additional institutions became members of the Alliance, bringing the total number of institutions participating in the shared LMS to 39.

Prior to the Alliance migration to a shared LMS, the 37 member institutions were managing their electronic resources in different ways using a variety of ERM products in addition to their local ILS. A survey done by the Alliance’s Collaborative Technical Services Team (CTST) Serials/ERM Working Group to determine ERM practices across the Alliance prior to migration revealed that:

- 35% of Alliance members used Innovative’s Millennium ERM;
- 23% of Alliance members used Serials Solutions’ 360 Resource Manager;
- 60% of member institutions used Serials Solutions’ 360 link resolver;
- 54% of Alliance members used other solutions (either no ERM product or some combination of the WorldCat knowledge base, Microsoft Access, Microsoft Excel, CORAL or EBSCONET).

This practice of using both a variety and a multiplicity of systems to manage electronic resources was by no means unusual, as indicated in the library literature. “Somewhere in the period 1998-2008, the ILS no longer merited its capital “I”: it no longer integrated a library’s processes in to one system ... these

multiple systems [i.e., an ILS, an ERM, and a digital repository] are increasingly expensive and difficult to maintain” (Gatenby, 2008). Branscome’s 2013 study of electronic serials management in academic libraries likewise noted that, “while many of the academic libraries represented in this survey utilize their ILS systems for management of online journals, far fewer use an ILS system as the primary tool for handling these tasks with resources more specifically targeted towards management of electronic resources being more popular ... many of the libraries represented in this survey make use of a variety of different tools in combination to manage their online journal collections” (Branscome, 2013).

The Alliance Serials/ERM Working Group survey mentioned above also asked participants what they hoped to gain from moving to a shared Alma implementation. Most hoped that Alma would provide the ability to use one system instead of the many “increasingly expensive and difficult to maintain” systems to manage electronic resources. It was clear from the survey that there was great interest among Alliance libraries in pushing some management of electronic resources either to the consortia level or sharing the work among member libraries, as a large number of electronic resources were now being negotiated, licensed and purchased centrally.

The Alma LMS offered the opportunity for shared work that would not have been possible or practical with 37 separate ILS. Alma consists of three work zones or areas: an Institution Zone, a Network Zone, and a Community Zone (see Figure 1). Each Alliance institution has its own Institution Zone (IZ) which contains local bibliographic records, inventory, acquisitions records, and licensing information. All Alliance libraries share a Network Zone (NZ), which contains the shared bibliographic records of all Alliance libraries, along with any inventory or license information that is managed centrally. Information specific to individual libraries, such as copy-specific notes for special collections or archival materials, is stored in local extensions of NZ bibliographic records. These local extensions show in each institution’s

IZ only. Staff across the Alliance can use the NZ to see which institution in the Alliance holds what resources. All Alma customers share the Community Zone (CZ), which is the central knowledge base for Alma. The Alma LMS thus held the promise of being able to more efficiently manage both local and shared electronic resources throughout their life cycle.

The screenshot displays the Alma Repository Search interface. At the top, there's a search bar with 'Alma' and a search icon. Below it, the search criteria are set to 'where Keywords contains margaret atwood marion wyni'. The search results are sorted by Rank. A Venn diagram is overlaid on the right side of the search results, showing three overlapping circles: 'Institution Zone (37)' (orange), 'Network Zone (The Alliance)' (green), and 'Community Zone (Alma knowledge base)' (blue). The search results list three records for 'Margaret Atwood / Marion Wynne-Davies', including details like ISBN, subject, language, and record number.

BENEFITS & CHALLENGES OF IMPLEMENTING A SHARED SYSTEM

The “living, ever-changing, and growing” nature of the ERM (Beals, 2010) brought many challenges to the authors and to other staff at Alliance member libraries during the Alma implementation process. At the time of migration, Ex Libris was actively building and rolling out functionality in Alma. New ERM features were continuously being added and enhanced. The beta nature of the product meant that it was difficult for staff, when troubleshooting issues, to know whether the problems were on the Ex Libris’ side or at the customer’s end due to a lack of understanding of the system changes. The Alma documentation supplied by Ex Libris was not always complete, nor did it account for every possible

situation. Library staff often needed to work with Ex Libris to improve, clarify, and update the documentation. The rapid migration schedule meant that staff were generally not able to grasp the full scope of the basic structure and design of Alma prior to going live in the system. Staff in earlier cohorts were not able to support the migration of later cohorts to the extent that was originally envisioned (Shadle, 2015). Migration forms were revised and altered by Ex Libris after each cohort migrated, making it impossible to have a cookie-cutter model to follow.

A major challenge for many staff was simply understanding the structure of Alma. Most Alliance libraries were long-time Millennium users. Alma uses very different terminology and has a very different record structure than Innovative's Millennium product. Additionally, Alma integrates electronic resource management into the LMS, rather than siloing it. The need to simultaneously and rapidly learn new terminology and adjust to a very different way of using an ERM proved daunting to most staff. Similarly, the incompleteness of ERM functionality when the first institutions went live and the lack of understanding about how Ex Libris envisioned existing and future ERM functionality proved frustrating to many institutions. The experience with and level of understanding of the complex nature of electronic resource management varied among the institutions as well as among the staff in each institution. As Collins and Grogg articulated in 2011, this is largely because "electronic resource management is chaotic. The processes involved in managing e-resources are non-linear and non-standardized; moreover, the complexity of e-resource management is often underestimated by those who are not deep in the trenches." The ERM needs for large institutions were quite different and necessarily more complex than what were needed for smaller institutions.

However, implementing a shared system was not without an equal number of benefits. For example, working groups, such as the Alliance's CTST Serials/ERM Working Group and the CTST Acquisitions

Working Group, used biweekly phone calls and email lists to share information about the migration and about how they were using Alma to manage electronic resources. Staff who worked with electronic resources who may have previously had little direct interaction with their colleagues at other Alliance institutions were now interacting and exchanging information on a regular basis. Sharing and discussing the pain related to migration fostered a greater sense of collegiality and encouraged institutions to support one another during migration and post-implementation. Additionally, the size and scale of the migration gave the Alliance a strong and unified voice when working with Ex Libris to implement new ERM functionality and address areas needing additional development. The fact that all Alliance institutions were in a single system meant that the Alliance was now finally positioned to realize the Alliance's strategic "work smart" goal to "do things once, do things together, do things the same." (Orbis Cascade Alliance, 2013).

Challenges in a large scale migration are always expected as "an integral part of any legacy systems migration" (SCONCE, 2014). But the Alliance migration in effect combined three huge projects into one, as John Helmer, Executive Director, Orbis Cascade Alliance, explained below:

1. Moving from many to one --Migrating from 37 systems to one, including a migration from local servers to a cloud application.
2. Next generation system -- Implementing a "next generation" library management system that requires that we think in new ways and engage in some degree of product development, especially where consortial functionality is concerned.
3. Collaborative technical services -- Creating innovative approaches to collaboration in technical services with a new shared system that provides improved options to experiment and explore the best ways to work together.

Helmer further pointed out that “any rational person can see the cost and risks involved in such a venture but there are costs and risks to inaction as well.” (Helmer, 2012) His sentiment was echoed in the Alliance community that we cannot achieve our dreams by playing it safe in today’s economic climate and highly connected and cloud-based environment. Admittedly, the migration was a scary and somewhat painful process, but Alliance staff have learned and grown so much from taking the risk, which makes our work much more rewarding.

FUNCTIONALITY AND WORKFLOWS IN A SHARED SYSTEM – DOES ALMA IMPROVE ERM?

In 2004, the Digital Library Federation’s (DLF) Electronic Resources Management Initiative (ERMI) report identified several outstanding ERM issues, including consortium support and functionality (Jewell, 2004).

Eight years later, Bob McQuillan noted, “challenges with electronic resource management system implementation, interoperability, management, and work-flow issues remain,” (McQuillan, 2012).

Hartnett et al. sagely commented that, “finding the Holy Grail might be easier than finding the perfect ERMS” (Hartnett, 2013).

In 2011, Maria Collins and Jill Grogg surveyed librarians and ERM vendors to assess ERM development and to gauge the impact of the standards and initiatives. Collins noted that, “the ERM systems that have been developed have addressed some needs very well ... [but] left other issues ... unresolved” and asked the question, “To what extent have we solved these challenges and what obstacles remain?” (Collins, 2011). In that article, the authors identified librarians’ top six priorities for what is wanted and needed in an ERM, including:

1. Workflow and communications management
2. License management

3. Statistics management
4. Administrative information storage
5. Acquisitions functionality
6. Interoperability

How well has the Alma LMS done at addressing librarians' top six priorities for electronic resource management at the local and consortial level, as identified by Collins & Grogg?

1. Workflow and communications management

“Librarians ... often end up piecing together manual workflows to accommodate ERM tasks.” (Collins & Grogg, 2011). As Alliance libraries began spending more of their collections budget on electronic resources, it became clear to some institutions that the disparate systems used to manage electronic resources had introduced information silos, creating barriers to efficient workflows. Portland State University (PSU), for example, had to create ERM process charts to clarify what pieces of the workflow were managed in what system and by what unit. Maintaining accurate information in the public catalog was becoming more difficult and required more work; both PSU and the University of Washington (UW) used the Serials Solutions knowledge base but updates were loaded into Millennium only once a month. The monthly updates required a significant amount of manual handling to resolve mismatches and embargo periods. Staff often had to manually update coverage in Millennium because they did not want inaccurate coverage data to remain in the catalog until the next monthly load. Receiving coverage updates only once a month was becoming more problematic as the number of electronic resources being managed continued to grow. Many smaller institutions did not have an ERM system. Some institutions had the Millennium ERM, which functioned well, but it too was siloed in a separate module.

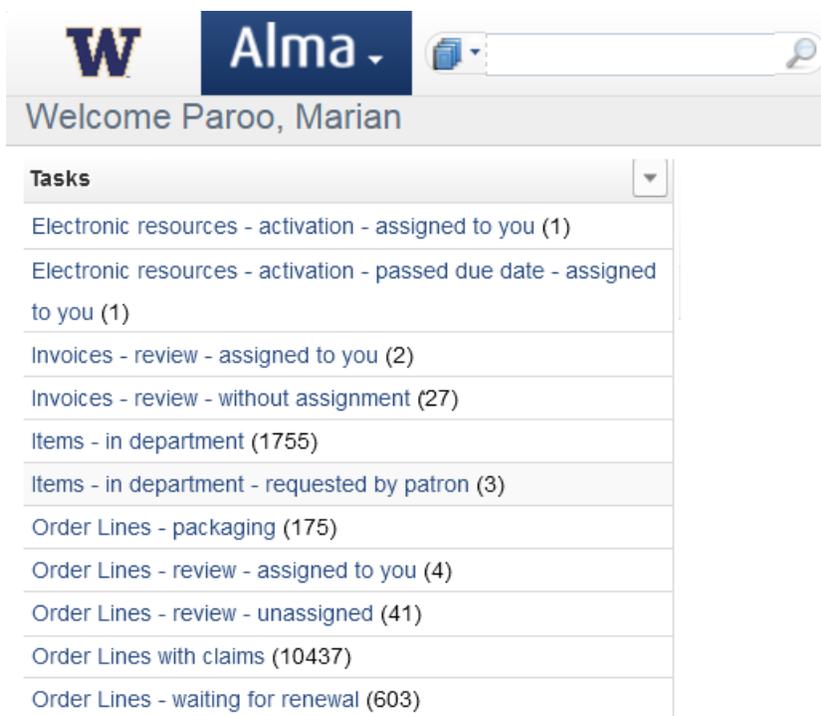
One of Alma's strong points is the way electronic resource management is distributed throughout Alma, rather than siloed into a single module. Staff can order and/or activate titles directly from the CZ and have bibliographic records immediately appear in the NZ and electronic inventory in the IZ. In the CZ, staff may choose to activate all titles in a collection such as for an aggregator database, or only select certain titles, such as for an electronic journal package. Staff can also add titles to a collection by uploading a spreadsheet. At any time, staff can use the NZ to determine what other institutions in the Alliance also own a particular title. Ex Libris also recently began adding bibliographic records for all packages/collections (e.g., a bibliographic record for the Springer ejournals collection) in the CZ. Alliance institutions can now not only see what individual titles to which other Alliance institutions subscribe, but also to which collections or packages other Alliance institutions subscribe, regardless of whether the institution has opted to subscribe to the collection/package through the Alliance office, or directly with the publisher. The Alliance office does maintain a web page showing which institutions subscribe to which resources but only for resources negotiated centrally by the Alliance.

Because the knowledge base is integrated into the LMS, coverage changes, and title adds and drops for aggregator packages can be automatically pushed out to activated resources in the IZ. A CZ Updates Task List in the IZ, which is refreshed weekly, summarizes coverage changes, title adds/drops, URL changes, and collections deleted from the CZ. Operators may review changes and determine if any maintenance needs to be done. Staff can quickly report coverage or URL errors in CZ-maintained resources to Ex Libris Data Services staff simply by clicking on a "Send to Ex Libris" link beside the resource. Staff can also contribute open access resources to the CZ from within the LMS.

Another strong point with regards to workflow management is Alma's Electronic Resource Activation Task List, which assists libraries in "routing the resources from one step to another, and from one staff member to another" as well as provides "a system of reminders to assist with tracking work stages" (Collins, 2011). Electronic resources are automatically pushed to the Electronic Resource Activation Task List whenever a POL is created, but may also be manually pushed to the Task List, reflecting the reality that electronic resources need support and tracking throughout their life cycle. In the Task List, the operator can designate a status (e.g., Waiting for Licensing) and, for new resources, indicate the expected Activation Date. Resources not activated by the expected Activation Date are pushed to the Claim Task List for follow-up. Statuses on the Electronic Resource Activation Task List are customizable by the institution, recognizing that the electronic resources workflow at a small library may be very different from the workflow at a large library. Statuses do not have to be followed in a linear fashion reflecting the chaotic nature of electronic resource workflows and the fact that the steps necessary to activate one resource may be quite different for another. Resources on the Task List can be assigned or re-assigned to operators and a due date set; if the task is not completed by the due date, Alma will send the operator an email reminding them that the resource is still on the Task List and that the status should be checked. Assigned tasks will also appear on the operator's own task list on the main Alma menu when they are due for attention.

Unfortunately, what the Electronic Resource Activation Task List does not do is provide operators with a checklist of what steps in the electronic resource workflow have been completed and what have yet to be done. For example, while an operator can designate a status, the Task List does not track what statuses were previously designated. Operators still must follow a checklist (e.g., Added URL to proxy table, Requested MARC records, Sent License to review, Notified selector resource is available, Added resource to Database A-Z list) outside of Alma to ensure that all steps have been completed.

Another tool that is invaluable for maintaining electronic resources is the Renew Task List. Resources can be scheduled to display on the Renew Task List any number of days before the subscription is set to expire, reminding staff that the resource will be soon need to be renewed or cancelled. Such a tool allows staff to notify the publisher of an intent to cancel in sufficient time, for example, to avoid breaching a contract where intent to cancel must be made clear X number of days before subscription expiration. These Task Lists help ensure that the various steps in an electronic resource's lifecycle are completed, regardless of which department in the library has responsibility for those steps. The various Task Lists are grouped together and automatically displayed on each user's Alma home page (see Figure 2).



At the Network level, Alma provides a number of functions that allow central management of electronic collections in the Alma Network Zone on behalf of either *all* member libraries, or *any subset* of member libraries that subscribe to or purchase a particular publisher package of e-resources. These include the ability to set up a consortia-wide PDA/DDA program and to centrally manage and load electronic

collections and packages. For example, if several institutions subscribe to a package, a collection record for that package can be created centrally in the NZ, bibliographic records for the package loaded centrally, and then access established for all institutions. For U.S. federal government documents that are available electronically, a single MARCIVE load could be loaded centrally and then pushed out to all consortium members. One disadvantage to managing collections centrally is that while the individual titles in the collection appear in each institution's Primo instance, the individual titles do not appear in each institution's Alma Institution Zone. Because the inventory is managed in the Network Zone, rather than in the Institution Zone, the bibliographic records for the titles appear in the Network Zone only. Thus, the risk of order duplication is increased and troubleshooting when a resource goes down becomes more difficult, unless staff remember that the package is centrally managed. Although the Alliance has successfully loaded two collections common to several Alliance members (*Met Opera on Demand* and *Alexander Street Press' Theatre in Video*), it has held off loading additional collections in part due to capacity issues at the Alliance level. While member institutions are eager to push more work to the network level, particularly in terms of record loading, the reality is that the Alliance office is not yet sufficiently staffed to support such a shift in work from member institutions.

2. License Management

License information can be tracked in the Alma License Record. A License Terms area allows staff to track terms of use, restrictions, perpetual rights, and obligations. Libraries have the option of displaying these terms in Primo, not only informing users of the license terms, which is often contractually required, but also allowing Interlibrary Loan (ILL) staff to determine what ILL rights have been agreed to. The signed license and other supporting documentation may be scanned and uploaded as an attachment, eliminating the need to store PDFs outside of the LMS. While the license record can be

easily linked to and accessed from the order record and inventory, there is no automated way to push institution-specific license terms such as coverage or embargo periods to the link resolver. Instead, staff must manually edit knowledge base coverage dates. Alma also supports the ingestion of ONIX-PL formatted licenses, although the use of this standard has yet to be widely adopted by resource providers. Currently, there is no automatic tickler function built in the Alma License Record that would serve to remind staff that a license is approaching expiration. Additionally, it is not yet possible to query license data in Alma Analytics, Alma's Oracle-based statistics and reporting module.

For resources that are managed centrally, a license record can be added in the Network Zone on behalf of subscribing Alliance institutions and terms pushed out to each institution's Primo instance.

Bibliographic records and inventory may also be loaded, activated and managed centrally on behalf of the member institutions. The Alliance is just beginning to develop workflows to take advantage of Alma's central licensing and inventory management capabilities.

3. Statistics management

Before migration, Alliance libraries had various ways of collecting usage for electronic resources. At PSU, Serials Solutions' 360 COUNTER product was used to track statistics while UW used Swets' ScholarlyStats product. In addition, both institutions relied on manually harvesting statistics from vendors that were not supported by Serials Solutions or ScholarlyStats. COUNTER reports are generally preferable, as the standard makes it clear what the numbers are measuring, and COUNTER reports can capture all usage of the library's e-resources. For vendors that don't have COUNTER reports, Serials Solutions could be used to harvest reports on the vendor's administrative website that contains info similar to what is in COUNTER. Based on their experience, the authors found that these services were the most cost

effective ways to deal with various aspects of gathering, managing and reporting on usage statistics without having to spend a great deal of time manually collecting usages from each vendor.

With the migration to Alma complete, all Alliance libraries can now access UStat, Ex Libris' usage statistics service. Similar to 360 COUNTER, usage reports in UStat are created through both SUSHI harvesting and manual uploads. To enable harvesting of usage statistics data from a SUSHI vendor, libraries need to create a SUSHI account for a specific vendor and subscriber in UStat, a process that is labor intensive and time consuming. Although the number of SUSHI vendors configured in UStat was initially small, additional vendors are being added by Ex Libris as the product matures. The automated harvester does not guarantee a 100% success rate; manual editing is still required when errors are created via auto SUSHI harvesting. It's possible that this may be the result of vendors providing unstable SUSHI services, rather than any fault of the UStat module. Since not all vendors provide COUNTER compliant usage reports, UStat supports manual upload of data, allowing libraries to upload statistical files downloaded from the vendors in order to generate reports in UStat. UStat doesn't collect database usage via SUSHI, so manual uploads are still required for database reports. Cost usage must be entered in UStat to generate cost per use data. Additionally, UStat presently only handles COUNTER reports for Journal Report 1 and Database Report 1. Alliance libraries therefore continue to employ a variety of ways to collect usage data including UStat, vendors' administrative sites, and email communication as needed. The uploading feature is easy to use, provided the files meet the format requirement (csv, Microsoft Excel, XML). Ex Libris recently announced plans to move the functionality of uploading COUNTER reports from UStat to Alma, which would allow libraries to load COUNTER reports and to set up a SUSHI account for automatic harvesting of reports via Alma. The purpose of integrating usage data directly into Alma is to allow staff to review usage and cost-per-use in a single interface.

As more COUNTER usage reports become available, the way Alma ingests statistics-related data needs to keep pace with the demand. Book reports and multimedia reports are becoming an increasingly important part of a library's collection development decision making process. The authors also wish to see a new feature implemented to allow an automated process for setting up SUSHI accounts by populating required data via upload eliminating laborious manual data entry.

4. Administrative Information Storage

Alliance libraries that used Millennium's ERM were able to store vendor contact, such as names, email addresses, phone numbers for sales representatives or technical support staff, and administrative information, such as login credentials to administrative and statistics modules for electronic resources in the Millennium contact record. Millennium also had vendor records, a separate record type that was used mainly to record vendor payment address information and general vendor contact information such as toll-free telephone numbers. Because Millennium had a very granular permissions structure, the ability to view and/or edit contact records could be restricted to only staff who worked with electronic resources.

Alma provides specific fields for storing vendor contact and resource administrative information in the Alma vendor record. Consolidating all information for a vendor (e.g., payment, general contact, specific contacts, administrative module information) into a single record, rather than splitting it between a vendor record and a contact record has both benefits and drawbacks. An obvious benefit is that all information is now maintained in one record – the vendor record. A drawback is that because there is only a single record type and because Alma has a much broader permissions structure, login credentials

for administrative modules are exposed to many more staff, including those who do not work with electronic resources or should not have access to the modules. A second benefit/drawback is that the Alma vendor record consists of multiple levels – a vendor record at the top level, with a vendor account and/or vendor interface nested below. All three levels – vendor record, vendor account, vendor interface – have tabs to store contact information. While the ability to store contact information at all three levels provides institutions with flexibility, it also means that unless the institution has clear policies in place regarding where it chooses to store contact information, staff will end up looking at all three levels to find the contact information they need.

Although vendor records can be created centrally in the Network Zone and then pushed down to each Institution Zone, this functionality has not been implemented by the Alliance. While many Alliance institutions share common vendors (e.g., EBSCO, YBP, ProQuest), the large and diverse nature of the Alliance’s membership means that the vendor details (e.g., sales representatives, account structure) for each institution may be quite different. Additionally, because the functionality to share Alma vendor records across a network did not arrive until part way through the Alliance migration, those institutions that had migrated had already set up their vendor records and vendor codes and saw no value in attempting to synchronize institution level vendor records with network level vendor records. However, for a smaller, more homogenous consortium, the sharing of vendor records could prove to be quite advantageous.

5. Acquisitions Functionality

In terms of functionality, Alma adequately supports budget and fund management, financial reporting and invoicing at the institutional level. Nelson noted that “One of the remaining challenges for all ERM

and local system vendors is to provide more interoperability between the ERM and acquisitions module” (Nelson, 2010); Alma more or less achieves this interoperability and functionality. Order records created for purchasing electronic inventory may be linked to the associated inventory records, license records and vendor records, allowing acquisitions staff to move from the order record to any related records and back without having to exit the order record. The ability to both see all associated record types and navigate to them from a single point of entry improves staff understanding of electronic resource management. Disappointingly, order records created for purchasing physical inventory or for tracking access or hosting fees cannot be linked to associated license records. For orders for physical inventory with license terms, such as DVDs with terms for public performance or digitization, or for annual access or hosting fees, the only option is to note that there is an associated license record on the order record notes tab. Like the license record, the order record has an attachments tab, where attachments containing information that might be especially relevant for acquisitions staff, such as business terms or pricing for a multi-year agreement, can be uploaded.

Alma has two types of electronic inventory: collection records and portfolios. The collection record is the top level of the electronic hierarchy and may be used to represent an aggregator or package (e.g., EBSCO Academic Search Complete; Elsevier ScienceDirect). The portfolio is the lower level of the electronic hierarchy and represents an individual title (e.g., a journal title within Academic Search Complete or ScienceDirect). Order records may be attached either to the collection record or the bibliographic record for the aggregator or package; i.e., if the institution has opted to catalog EBSCO Academic Search Complete or Elsevier ScienceDirect, then the order record may be attached to either the collection record or the bibliographic record for the aggregator or package. (Order records cannot be attached directly to portfolios but only attached directly to the bibliographic records for the portfolios.) While the ability to attach order records to either collection records or bibliographic records

provides flexibility, it also provides confusion if the institution has not developed procedures that clearly indicate to what record type the order should be attached.

Presently, the Alliance office is not using the Alma NZ to create order records and track payments for centrally purchased or brokered resources, in part because most institutions already need to create their own order records in their IZ in order to track payments made to the Alliance. In the future, should the Alliance opt to manage more inventory centrally in the NZ, there may be an advantage to creating order records in the NZ so that cost-per-use can be calculated for the Alliance as a whole.

The Alma Analytics module, while a powerful tool in terms of supporting acquisitions functionality, has a steep learning curve. Like UStat, the module is external to Alma. Data is updated once a day, rather than instantaneously; in an environment where staff often need accurate up-to-the-minute financial statistics on very short notice, this time delay can sometimes be aggravating. Not all record fields can be retrieved in Analytics and it can be difficult to pull information from subject areas that do not have a direct relationship in Alma. Cost-per-use information can be pulled from Analytics but, as with much of Analytics, interpreting the results is not always intuitive. It is possible to create sets of records easily and intuitively directly in the Alma interface; however, the fields that can be pulled are limited. Alma Analytics thus remains to many staff a mysterious tool of great power.

6. Interoperability

Alma was designed to interoperate with other products such as discovery interfaces, interlibrary loan systems, external financial systems, course registration, course management systems, and other third-party systems.

To enable discovery of the library's content via Primo, the Alma Publishing Profile allows libraries to export bibliographic records to Primo via scheduled jobs on a daily basis. Primo then harvests and normalizes the exported Alma records to be searched and discovered by end users. This functionality is accomplished by configuring an Integration Profile with a S/FTP connection for Primo. Local inventory and availability information is sent through real-time calls back and forth between Alma and Primo. Additionally, institutions may profile collections in the Primo Central Index (PCI), an index covering hundreds of millions of journal articles, electronic books and other materials from a wide range of information providers. Primo displays PCI content in search results and links users directly to the article content.

Because the Alma Network Zone contains virtually all bibliographic records belonging to all Alliance institutions, researchers can search Primo to see content held locally by their home institution or regionally at other Alliance institutions. However, if researchers are interested in knowing what resources on a particular subject exist at libraries beyond the Alliance, they must re-execute their search in WorldCat. For researchers used to searching for both local and global resources in a single interface, as they could when Alliance libraries subscribed to the WorldCat Local discovery layer, the shift to Primo has been a step back.

While it is possible to publish information about physical holdings from Alma to OCLC, it is not yet possible to do so for electronic resources. While OCLC is working on an API that will allow electronic resources to be published from Alma to OCLC, release of that API is several years away. WorldCat's lack of full interoperability with Alma means that some Alma institutions are continuing to offer profile resources in both the Alma CZ and the WorldCat Knowledge Base (WCKB). Virginia Commonwealth

University libraries have adopted a new approach to fill the void by using both the Alma CZ and WCKB for managing their electronic resources. “We believe that the parallel use of the Alma CZ and WCKB for managing our comprehensive collections is the best way we have found for providing user access to the majority of our electronic resources.” (Barbara Anderson, presented at ELUNA 2015 Conference). Additionally, it offered ILL staff “the opportunity to provide quicker turnaround time, and increased direct/unmediated ILL transactions.” Although the “parallel use of the Alma CZ and WCKB” sounds appealing and may improve researcher access, it requires activation and maintenance of electronic resources in two systems, which is not desirable for a consortium looking to “do things once”.

Publishers, book vendors and subscription agents have all developed either integration profiles or APIs that can interoperate with Alma, allowing resource acquisition and management to become more automated. Alma institutions who do ordering in YBP’s GOBI interface have the option to have a YBP API create an order record in Alma when a title is selected in GOBI. EBSCO, Coutts and Harrassowitz are developing or have developed similar APIs. Alma institutions who subscribe to ScienceDirect can set up an Elsevier integration profile that will allow their ScienceDirect holdings and coverage in Alma to be automatically updated on a weekly basis. This interoperability is highly desirable and addresses some ERM features that librarians have long identified as priorities for development.

THE PROMISE AND THE REALITY

Sharing a common next-generation library management system, one that allows institutions to use a single system to manage electronic resources throughout their life cycle, is critical to achieving the Alliance’s goals of working more efficiently and more collaboratively. Given that Alliance institutions can now manage their electronic resources on a single, shared LMS, Alma largely meets these goals. Alma is

a huge improvement over the fragmented resource management model, combining LMS, ERM, knowledge base, link resolver, analytics, and A-Z journals search all in a single one unified platform. This integration has allowed Alliance libraries' electronic resources management to shift from a distributed and disparate environment to one that is shared, consolidated, and more transparent; it enables more collaboration, better support, training, and documentation, and shared workflows among library staff across the institutions and departments in managing their electronic resources life cycle.

However, no system is perfect, particularly when a system is required to serve the needs of a consortium comprised of very diverse institutions. As with all knowledge bases, coverage information in the Alma CZ is not always accurate and the quality of metadata can be inconsistent: for serials, CONSER records are generally available so the quality is good; for monographs, there are often only brief records. Print records are sometimes used for electronic titles, causing access issues and/or Primo display problems. Although staff can easily report errors or request additions to the CZ from within Alma, it can sometimes take several weeks for Ex Libris Data Services to resolve the issue, in part depending on its complexity and the responsiveness of the publisher.

As noted above, consortially managed resources have their own set of challenges. The inventory for resources that are managed centrally appear in the Alma NZ only, increasing the risk that institution's will purchase duplicates of titles they already own. Packages that are purchased by all consortia members but have institution-specific URLs must be managed locally, the Alliance's Ebrary Academic Complete package being an example where this has occurred. License terms, regardless of whether they are input at the network level or the institution level, must be done manually, due to the limited adoption of ONIX-PL standards by publishers. The plethora of note fields in the various Alma record

types means that achieving consistency in where notes related to managing electronic resources are placed can be difficult at the institutional level and perhaps impossible at a network level.

Not all of the challenges lie with Alma. Some of the challenges reflect the growing pains of the Alliance. While all institutions have migrated to Alma/Primo, the consortium is just beginning to build and develop a sustainable model for shared work that will enable the consortium to take full advantages of Alma's ability to manage electronic resources at the network level. As Turner notes, "whether e-resource products are managed by central staff or volunteers at member libraries, the workload is heavy" (Turner, 2014).

CONCLUSION: A SHARED SYSTEM – IS IT WORTH IT?

Electronic resource management at both the institutional and consortial level is still not perfect; as with any ERM, perfection is a constantly moving target, given the changing and volatile nature of electronic resources. "It is unrealistic to think that a fully realized, completely interoperable ERM system could spring full grown from the head of Zeus" (Collins, 2011). It also unrealistic to expect 37 institutions, with 37 separate ERM workflows, to move from 37 legacy ILS' to a single shared next-generation LMS and to synchronize overnight their practices for managing electronic resources. Similarly, while the Alma LMS provides the capacity for centralized electronic resource management, the Alliance lacks the staffing capacity at this point in time to fully implement centralized management for electronic resources common to some or all Alliance institutions. The amount of staff time devoted to planning and implementing a shared LMS is high, higher than many Alliance institutions anticipated prior to migration, meaning that the efficiencies expected from a shared LMS must be considered over the long term, rather than over 2-3 years. Despite these issues, Alliance librarians are relatively pleased with the

current level of improvement that Alma ERM has brought to us in managing the electronic resources life cycle. As Collins and Gregg stated, “Building a better and more responsive ERMS is an iterative process, and no emerging system is a silver bullet. Nonetheless, it is possible to work together toward a more integrated e-resource solution.” Indeed, this is the direction that the Alliance has been heading towards.

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