Chapter 2

Elements of Electronic Resource Management

Abstract

Chapter 2 of Library Technology Reports *(vol. 50, no. 3) "Electronic Resource Management Systems: A Workflow Approach" provides a brief overview of the areas necessary for successful electronic resource management as well as the current software available to manage them. The chapter discusses the knowledge base of resource information, management of acquisitions, collecting and saving administrative records, storing license information, and compiling and producing reports.*

Managing electronic resources is complex because there are lots of pieces to track: updated title lists for journal packages, perpetual access flags, transfer titles, subscription and payment reminders, administrative information, and usage reports, just to name a few. Many of these pieces, such as title lists or publisher contact information, are interrelated and change on an irregular basis. Other pieces, such as usage reports, may need to be aggregated with reports from multiple publishers or cost information to be more valuable. In the case of acquisitions information, some connection to larger external systems is required in order to process invoices and generate payments for publishers.

To simplify discussion of resource management, I have divided it into five parts: knowledge base, budget, administration, licensing, and reports. These are not the categories used by the DLF ERMI report,[1] although the report is foundational to this work. Rather, these categories are somewhat discrete despite the fact that the information in them is interrelated. Managing electronic resources requires all five of these categories, but the amount of work required will vary from library to library. The level of software support and which element of software is used to manage each piece will also vary widely between different systems, including link resolvers and ILS systems.

The focus of this chapter is the elements of electronic resource management (ERM), what each one involves, and the software it has traditionally been linked to. Each section also includes a short overview of electronic resource management (ERM) systems and how they supplement or expand existing library systems such as the ILS (integrated library system). I have also tried to include some discussion of the relevant standards influencing software structure and functionality. The most important question I attempt to address in each section is why: why these elements are important for smooth management of resources, why they require dedicated focus, and ultimately, how they impact staff, vendors, and patrons.

Knowledge Base or Holdings

What Is a Knowledge Base?

A knowledge base (KB) is a database of information about some aspect of library resources. It generally contains the metadata of subscription or purchased information or links to journals or books rather than the content itself, although this requirement is loose. The most common type of KB for the purposes of ERM includes information on the journal titles in a database or subscription package, the dates held in the database, and links to access the content. KBs can also include information such as journal titles available for subscription or purchase from the publisher, platforms, and price or license terms about legal usage of library-subscribed content. Because journal titles, available issues, and links change frequently and are

collected from many different publishers, maintaining KBs is extremely time-consuming, far more than most libraries could manage individually. In an article by Marshall Breeding, he pointed out, "One of the fundamental observations of this study involves the tremendous resources it takes to create and maintain these e-content knowledge bases."[2] For this reason, vendor-curated KBs have become increasingly popular and common, generally integrated into other library software such as an ERMS.

Why Knowledge Bases Are Important

Having a knowledge base is extremely important because the collection of information on electronic resources is the fundamental piece required for almost any library software to work. Large databases sold as a content package have many title changes, which need to be updated in patron systems. These updates and purchases can involve hundreds of titles in each package and multiple packages for each publisher. Additionally, most of this information is common to multiple libraries; for example, a publisher selling a package of journal titles will make it available to many libraries, so the information about the titles is relevant to all subscribing libraries. If titles within the package change, all of the subscribing libraries will need this update. Because so much upkeep is required, the general trend is for a company or large nonprofit to create and maintain these databases. Individual libraries usually also need to track any individual data or unique collections, but adding these holdings to a KB is easier than creating and maintaining all holdings for a large library. This means that external vendors are well placed to develop and maintain KBs and can then use the curated information as the basis for valuable software subscribed to by libraries. This software includes link resolvers, batch MARC records, or subscription aggregator databases such as those held by EBSCO and SwetsWise.

One issue created by each vendor maintaining its own KB is that of data silos. Essentially, since the title and holdings data is so complex and changes so fast, it is likely that each vendor may have a slightly different version of the same package data. This problem may be exacerbated by relationships and competition between publishers. Even without specific companies' competition, however, every library needs to get the most accurate possible holdings information aggregated from subscribed vendors, usually by subscribing to software that includes a presumably accurate and up-to-date KB.

This holdings information is important for generating journal title lists, such as an A–Z list, and for journal title search, but it is also necessary to create OpenURL links, which are generated from citation information and subscribed content lists. The better the data in the KB, the more likely it is that the OpenURLs will be generated correctly.

Literature Review

In his recent article, Ross Singer outlined some historical efforts to create and maintain joint, non-vendor-specific knowledge bases, although he was sweepingly disappointed at current options available to libraries.[3] The Knowledge Bases and Related Tools working group, or KBART (also mentioned in chapter 1), has the goal of improving OpenURL linking for the benefit of all parties involved. When information in the KB is not correct, this can lead to links created incorrectly to unsubscribed content and no access given to subscribed material. The working group has tried to establish what categories of data need to be provided, who should provide the data, and who should receive it, as well as trying to improve the process of reporting errors and difficulties.[4] A follow-up article on KBART pointed out that it has been adopted by many publishers and major ERMS providers and outlined the steps publishers can follow in order to provide better, KBART-approved data.[5] The end goal will be for all publisher metadata to be listed in the KBART content registry. Sarah Glasser went a step further to explain in detail the relationship between incomplete KB information, standards such as OpenURL and digital object identifiers (DOIs), and initiatives such as IOTA, which attempts to measure failed URLs and problems with content access caused by OpenURL resolution issues or inadequate information provided by the publisher.[6] Marshall Breeding was commissioned by the National Library of Sweden in 2012 to do a detailed analysis of the major KBs and link resolvers, which speaks to the importance of the KB. He suggested that as the KBART practices are more widely adopted, overall access will improve and the differences in commercial KBs will be reduced. He further noted that KBs and link resolvers are increasingly included as part of ERMSs as opposed to being sold separately.[7]

Current State of the Industry

As it stands, many libraries have multiple knowledge bases. They maintain their ILS with MARC records to manage print materials, and they may or may not also catalog electronic books and journals. Most libraries also have a link resolver with a KB of all the journals the library subscribes to, including both individual titles acquired through a subscription agency and databases of journals or database packages. If interlibrary loan is allowed for these titles, the library must also ensure that the titles are represented in the OCLC KB as available for loan. Medical libraries may also need to update the National Library of Medicine DOCLINE system for interlibrary loan. There may also be additional systems: to manage purchase and budget information; an A–Z list of journal titles, which may be part of the link resolver or separate; and a list of

databases and packages subscribed to, which again might be part of the link resolver, included in the ILS, or a completely separate set of web pages or database.

Keeping all of these KBs updated and synchronized can be problematic. To take a simple example, imagine a library with a link resolver and an ILS. This library batch catalogs its serials MARC records by downloading sets from its database publishers and uploading them in large groups. The A–Z list of subscribed journals is created by the link resolver. When a new journal package is added, the library would need to update subscription information in its own records, batch-catalog the titles, update the link resolver, and add any additional information (license, contract, technical support) to the ILS, the link resolver, or both, as well as process the invoice and payment information. A library that gets its MARC records from the vendor would also need to set holdings in OCLC. The potential for complication and the need to maintain multiple KBs only increases with additional systems and with more complex subscriptions.

One somewhat ironic phenomenon is that the complexity of management increases very quickly with new subscriptions. For a library with only a few databases that does not catalog electronic resources, this scenario seems ridiculously abstract and complex. However, as soon as the library decides to have the same holdings information available through more than one portal or to have the link resolver and the catalog reflect all the electronic holdings, this issue quickly becomes very important.

Some libraries have had success with using the ILS as their main system and expanding the use of MARC records to cover more formats. MARC records were originally created for print books, and the need to represent relationships between print items, such as series, worked very well. Now that the relationships between an article, a journal, a publisher, a platform, a subscription vendor, and an invoice all need to be represented, MARC is no longer the only, or the most obvious, tool. Some ILS vendors have been very successful integrating different types of records, such as the order record and the license record, into the ILS, but the records are not standard outside of these particular systems and may not address the entire problem of accurately representing electronic resources.

Knowledge Bases' Impact on Other Pieces of ERM

The need to update multiple different knowledge bases with the same or very similar information causes frustration for librarians. One potential solution is to have ways to easily export the information from one system and easily import it into another, or better yet, to have the two systems automatically update each other. These two solutions are possible only if the two systems are interoperable and follow the same standard conventions for naming items, exporting and importing data, and allowing data connections with external systems. Several steering groups and standards committees have identified interoperability as a major issue in electronic resources management in the DLF ERMI report and a 2008 white paper devoted to the topic.[8] If each software system is standards-compliant, it is easier to export and import data from one system to another and to keep each system up-to-date. The standards are still new and not fully adopted but were developed with input from each of the major software vendors in the field and have lots of potential for the future.[9]

One solution many libraries have tried is to purchase all or most systems from the same vendor. If each system is from the same vendor, the theory is that interoperability would be less of an issue. The systems might be more likely to have built-in APIs (application programming interfaces) to pull data from each other, and if data does need to be exported and imported manually, at least it would be closer in format and require less manual editing. This approach is discussed at length in chapter 3. One thing to note briefly is that while using the same vendor may help with interoperability, not every vendor's systems are fully internally interoperable at this time although most major vendors have identified this as a goal. It is encouraging that major players in the software industry see a unified KB and interoperability as a major goal. However, we are still in the early stages, and interoperability remains an issue for ERM systems in general.

Electronic Resource Management Systems

Electronic resource management systems (ERMSs) are another approach to the problem of multiple knowledge bases and data silos. The software attempts to represent the complexity of data for managing electronic resources: how a single journal can be available from multiple platforms and through different vendors, may have multiple URLs, and could be covered under a different license for each platform. Such a level of complexity is difficult to track in a traditional ILS but can be represented clearly in an ERMS KB. These software systems try to aggregate all sides of electronic resource management: the KB; budget, subscription, and purchasing management; administration and contact information for resources; license management; and reporting functionality; as well as other functional pieces, such as the link resolver and A–Z list. Bringing all of these aspects together in one software system can simplify management of resources considerably, but care must be taken in selection and implementation to ensure that the ERMS will actually solve problems with interoperability and data silos and will not simply create a new silo. Using an ERMS as a part of the electronic resources workflow and library software environment will be discussed at length in chapter 3.

Acquisitions—Budget, Subscription, and Purchasing

Acquisitions

Discussing budgeting and collection fund management in libraries is complex because there is so much variation in how it is handled from library to library. The amount of control a library has over its budget and purchasing (particularly for libraries within a university or library system), the total amount of the budget, consortial agreements, and what larger institution system a library may be part of all influence how budget and acquisitions information is tracked. Regardless of the library type and the external system, libraries still need to know the amount of their budget, what items were purchased, and what funds remain available and must be able to generate checks and pay invoices.

The most variable part of the equation is the connection between library systems and a larger institutional purchasing procedure. It is important to communicate budget information across library systems regardless of whether the ILS is actually the system used to cut checks and to communicate with the institutional purchasing system. Whether the ILS actually has this functionality, and whether it is complete enough to be the only purchasing system that a library requires, depends on the ILS and on the library.

Beyond the library, most institutions have a purchasing system that generates checks and tracks library purchasing against the general institutional budget. It is hard to speak definitively about this area since a wide variety of purchasing management systems are available for various kinds of institutions, including for public libraries and for larger academic institutions. The purchasing functionality and software required by institutions may be sufficiently complex that there may not be any particular interest or benefit in connecting the library system and the larger institutional system.

The ILS-Based Acquisitions System

One very common scenario is for a library to use the acquisitions module of the ILS to track purchase and subscription information. All the major ILSs have an acquisitions module or system, and some, such as Innovative Interfaces's Millennium, are famous for their ability to handle funds and complex accounting. All of these systems allow the entry of a price into a basic order record and the generation of a report of books ordered. Also, these systems can generate reports of amount spent per vendor, and the more sophisticated payment systems allow fund accounting. The fund accounting feature is helpful because it allows certain dollar amounts to be assigned to departments and collections and can then generate reports with multiple options for amount spent in each fund. This can simplify management of collections with money earmarked for purchasing certain types of materials, such as AV or fiction collections, or money given in trust for particular resources. Some ILSs even have an end-of-year fiscal close procedure and can generate checks to pay certain kinds of standard invoices directly. Some institutions require that all payments be dispersed by accounts payable, while other libraries are autonomous.

ILSs were generally created with the print world in mind. The purchase of electronic books and one-time journal archive purchases still work in the same way, although a few extra steps of licensing, verifying access, and technical setup with the proxy server and link resolver are involved. With electronic subscriptions to databases or journals, however, payment information may need to be tracked at the journal, database, subscription aggregator, or publisher level, or at all of them simultaneously for reporting purposes. Additionally, invoices may come at any point during the year, requiring the library to constantly manage a complicated subscription renewal process with resources at different stages in the process at any given time. This situation requires knowing not only what has already been spent, but when it should be spent, and it may involve reminding publishers to send invoices, renegotiating licenses, monitoring journal titles transferring in and out of packages, conducting trials of new products, and performing lengthy and involved statistics analysis for every subscription the library holds.

Managing subscriptions requires comprehensive budget reports as well as additional functionality and workflow management such as renewal checklists, alerts, and ways to notify other staff or departments when a certain task has been completed. It can be helpful, but not essential, to have these elements integrated into the systems that manage acquisitions work.

Other Acquisitions Systems

One option that is particularly popular in very large and very small libraries is in-house development of software to help manage electronic resources. These systems range from complex databases in MySQL or Oracle with web interfaces and reporting modules, to databases developed in Access or other do-it-yourself database software, to a system of spreadsheets tracking particular information for specific reports. These systems may or may not have a web interface, contain information helpful to patrons, or be accessible to more than a few staff members. Since these systems are so variable, it is impossible to make a blanket statement about advantages or disadvantages.

In very small libraries, the problems are somewhat different. A small or resource-strapped library may be able to take advantage of local talent to develop

systems but will then have the problem of maintenance. Using widely understood software such as Excel or Access may be extremely useful, but these systems are not customized for libraries and may take some work to set up correctly for a particular process. And in very small libraries, when the person who created the system leaves, the library may not have other staff members with the same expertise.

The CORE Standard

The expectation that most libraries track their acquisitions information in the ILS is so fundamental that shortly after the development of the ERMS, a white paper came out that resulted in a standard to facilitate the communication of information between the ILS and other systems such as the ERMS.[10] The *White Paper on Interoperability between Acquisitions Modules of Integrated Library Systems and Electronic Resource Management Systems,* published in 2008, included the thirteen required data elements considered to be absolutely essential for smooth communication between the ILS and ERMS.[11] At the same time, the need for such interoperability was recognized by representatives of Serials Solutions, EBSCO, and SirsiDynix, and they approached the National Information Standards Organization (NISO) about combining efforts and creating a standard for acquisitions information. The CORE working group was created in 2008, and between 2008 and 2009, it did the initial work of developing a glossary and identifying match points to be used in the further development of the standard, which was released in 2010.[12] A 2010 presentation by Dani Roach and Sharon Dyas-Correia discussed the standard, as well as the work-arounds that her library had put in place while waiting for the standard to be developed and implemented.[13] At the present time, NISO does not list any ERMS or ILS as fully compatible with the CORE standard, although this fact was attributed largely to the economic downturn right as the standard became ready for implementation.[14] Todd Carpenter also identified the "chicken and egg" problem as an issue for CORE implementation: since CORE is a standard for communicating information between different systems, the fact that very few systems are fully CORE-compliant reduces the incentives for other systems to implement CORE.[15]

NISO CORE: Cost of Resource Exchange
www.niso.org/workrooms/core

ILS-Based ERMSs

In response to the increasing predominance of electronic resources, ILS vendors have started to create ERM modules within their ILSs. These systems vary widely, as do the workflow templates that ILS vendors use to design ERM modules. From the ILS perspective, electronic resources are simply an additional type of resource requiring new types of records to be added into the existing structure of ILS records. In this view of the ERMS, there is no reason to create additional software for managing acquisitions because ILSs already have that functionality built in. This approach creates an ERMS that is an additional module of the ILS, purchased to fill in the pieces that the standard ILS doesn't already cover—for example, providing license records and a place to attach license PDFs, creating vendor and platform contact information record types, or linking holdings records for serials collections with database records. Whether this approach is helpful for a library will depend in large part on what the library staff hopes to get out of the ERMS. If they are happy with their ILS and have all acquisitions information in it, incorporating an additional module to manage the specific electronic resources elements may resolve any problems with resource management. This can be an extremely useful approach for many libraries, particularly those with large print collections and a simple electronic resource collection. If, however, a library does not have an ILS with a robust ERM module available or uses a separate system to manage acquisitions, an ILS-based ERMS might not be the right choice.

Administration and Contacts

An important piece of managing electronic resources is simply storing the information about each resource. This is particularly true of administration and contact information. Storing this information in an organized manner presents a challenge because there is a certain amount of detailed data that needs to be tracked for every publisher, journal, and database a library holds. Louise Cole wrote an impassioned and detailed account of the problems of administering journal content, mentioning several elements that would ideally be stored in the administration module, including vendor contract information, frequently changing passwords, and passwords for online access that are available only from the print title.[16]

Information about resource management is also necessary because of the large number of players in the electronic resources world. In a 2005 panel at NASIG, Alison Roth, Wendy Robertson, and Rocki Strader defined a checklist for e-journal access that detailed the responsibilities of the library, the subscription agent, and the publisher in terms of storing and providing different information about subscriptions.[17] According to this checklist, the library needs to provide access to resources, which involves storing and managing information about title selection,

pricing information, IP addresses, usage statistics, and invoice payment. Managing such information for the purposes of administering resources is a crucial piece of resource management.

Most ERMSs have the ability to track administrative and contact information built in. How this functionality is built in will depend on the system. ERMSs that are part of an ILS may have an additional type of record, a contacts record, to attach to the bib record. License records or other administrative records may also be a good place to keep administrative information. The other major type of ERMS has the contacts and administration information integrated with other electronic resources tools, such as the link resolver, or as an additional notes field entry in the knowledge base. One advantage of an ERMS, whether stand-alone or incorporated into the ILS, is that it is a purpose-built centralized place to compile library information for easy and controlled distribution within the library. Since the software is designed to do just that, it may be easier to use the ERMS than to create or adapt another system. This will of course depend on the complexity of the library's electronic resources environment and policies.

In a recent article that discusses ERMS functionality, Maria Collins and Jill Grogg note, "Many librarians surveyed said that the storage and central accessibility of administrative information, such as usernames, passwords, and vendor contact information, worked well. One respondent noted that a central gathering place for this type of metadata has improved some components of e-resource workflow."[18] Deberah England wrote and conducted a survey to discover the extent to which libraries were using the administration information functionality.[19] Her results indicated that only 20 percent of libraries were using ERMSs to manage administrative information, but that 48 percent would be interested in using that functionality. She found that libraries were predominantly still storing administrative information in spreadsheets and in e-mail or on shared drives, with some still using paper files. She also provided guidelines for implementing and collecting administrative data with the intent of implementing that module within an ERMS. The study did not measure the sophistication of the administration information in the ERMS or whether the libraries had ERMSs implemented at the time.

Administration Information

Administration information can be simple or complex. Usually at a minimum it involves the administrator username and password for each resource so that a librarian or library staff member can log in and set the library IP ranges, library name and icon, and link resolver button if necessary; activate subscriptions; and download usage statistics. Many journals have not only a username and password, but also a registration ID that is sent to a particular individual to activate the subscription and that is frequently required for renewing subscriptions and communicating with vendors. Even if the library keeps a fairly similar set of usernames and passwords and only one person is designated as the contact for all journals to minimize confusion, the library will still need to track and store the usernames, passwords, and registration information and to keep the information secure but available in case of problems. It is also extremely helpful to have a place to keep notes on the resource to track information such as purchased backfiles, cancelled print subscriptions, consortial affiliation or purchased fund, patron requests for the subscription, or notes on technical problems or additional functionality.

Contact Information

Another important piece of information to track is contact information. For many journals, the contact might be the subscription aggregator manager, but for other resources, particularly expensive databases, there might be a number of options. It is not uncommon for larger publishers to have an account manager assigned by regional territory, as well as a technical support department, billing department, and others. This also ignores the complexity of consortial purchasing agreements. If a subscription is managed through a regional purchasing consortium, a consortium representative could be the appropriate person to contact with billing or access questions. Even for multi-institution or university purchasing, the appropriate person to contact with questions can change for each publisher, each resource, and each problem.

It may seem that the individual or department responsible for liaising with the publisher, vendor, or consortium should keep the contact and administration information for licensed resources. For example, the serials department should maintain the registration information, and the person who licenses electronic resources should be the only staff member who has vendor contact information. In the days of paper files, this paradigm was common. However, the number of electronic resources continues to increase and with it, complexity and the demand for immediate problem solving. As in the example above, the consortial or group purchasing agreement may have a different library contact person from the journal aggregator, and multiple librarians in different departments may need access to the license. It is important to store contact and troubleshooting information so that it is both accessible and secure. There may be only one person who handles resources and vendor contacts; this makes it all the more important for administration and contact information to be easily retrievable and accessible in case of an emergency.

Keeping administration and contact information in a centralized place also helps to eliminate duplicative effort. If there is a central database or file that everyone in resource management can access and update, preferably available remotely to authenticated users, individuals in the department do not need to waste time maintaining an incomplete individual database. This means that if a library staff member is not available, someone within the library can still find the username and password to update the IP addresses or contact the publisher about access problems. This setup also provides some level of disaster preparedness: if one contact person is suddenly unavailable, or if it is difficult to physically access the library (for example, due to extreme weather conditions), other library staff members can still retrieve administration information and resolve problems.

Administrative and contact information is an area where it is very common for each department to maintain its own knowledge base. It is up to the individual library to determine if it is more helpful to have separate information based on the format or department that maintains it.

Impact on Workflow and Available ERMSs

An advantage of centralized contact and administration information is the incentive to define workflow. The library needs to decide where information will be stored. Administration information can preferably be stored with other information for managing resources, such as acquisitions information or license terms. Once all the information is entered into a system, the library has an opportunity to make a decision about who is allowed to access administration information and to set up procedures for resolving problems with electronic resources. Small libraries may never have developed a formal troubleshooting policy or a procedure for testing for problems and notifying the vendor. There are troubleshooting and ticketing systems available, but for any sort of troubleshooting or administration policy to work, it is best for the library to define the procedure for contacting vendors. This includes who can do it, under what circumstances, and where this contact should be documented so that the library does not lose valuable information to an individual's e-mail archive. All available ERMSs include some ability to track contact and administrative information integrated into the resource management, either as a separate module or as part of the basic ERMS functionality.

Licensing

What Is It?

Most of the electronic resources a library obtains will be subject to a license—a contract specifying how and when the resource can be used. These licenses are extremely important because they outline the rights and responsibilities of both the library and the publisher or provider. They can be very difficult to read because they are legal documents and written in a traditional legal style.

Licenses cover many aspects of resource use, from interlibrary loan terms to perpetual access to uptime agreements, access, and wrongful use. These terms affect different departments but are frequently tracked through the serials department. Since licenses tend to be long and complicated, and because even a small library might have a hundred or more, compiling and making available the terms and obligations for every license can be difficult.

Why Licensing Is Important

Because license terms outline the legal responsibilities of the library, it is important for the licenses to be available and understood within the institution. Different departments need different pieces of information from the license—the ILL department will need the ILL clause and restrictions; the systems librarian or IT liaison will need the clause on wrongful use and library security responsibilities; the serials department will need to know start and end dates, perpetual access, and title lists from the date of signing; public services will need to be able to quickly determine if there are unusual access restrictions, individual registration requirements, or access on mobile devices. Providing such information about many licenses to each department is a real information-management challenge, but it is necessary to ensure smooth functioning. Any department's service will be compromised if getting answers to simple questions such as these involves searching through a paper file and painstakingly interpreting the language.

Resources and Terms

There are some terms that frequently appear in licenses and define the most common functions for electronic resources. These terms are important to collect and make available because they have implications for multiple departments and for patrons.

The DLF ERMI report noted that the rise of electronic resources resulted in an increase in the number of license agreements used in lieu of copyright understanding and that despite some attempts to standardize license terms, licensing remains a complex issue.[20] The report also pointed out that licenses were one of the initial areas libraries were building homegrown systems to track as well as an area that required frequent evaluation and attention during the workflow cycle.[21] One of the deliverables of the DLF ERMI report was an XML Schema designed to allow easy exchange

of data, part of which includes license information, as well as to incorporate and build upon element schemas such as the Online Information Exchange for Serials (ONIX) metadata work.[22]

In 2005, building on this report, NISO created a License Expression Working Group, which expanded on a white paper by Ed Jones in which Jones suggested expanding an existing standard by the EDItEUR organization known as ONIX.[23] The License Expression Working Group project is run jointly by NISO and EDItEUR and is held as a standard to define license terms in such a way that they can easily be imported or exported from digital systems such as ERMSs, based on the ONIX format.[24] The working group consists of major players from the library software vendor and librarian worlds to ensure usefulness and impartiality. The standard consists of an XML format for license information and a complete data dictionary of licensing terms (EDItEUR).

Standardizing terms across multiple software systems and contracts is helpful to both libraries and publishers, saving both parties time and reducing confusion and noncompliance. Having terms standardized also makes it easier to display and distribute the data. This allows patrons to quickly and easily know about access restrictions, allows interlibrary loan and reference staff to easily remain in compliance with licensing terms, and overall helps to reduce confusion and speed up licensed access.

The most important clauses to track usually include interlibrary loan permissions, access and definition of authorized users, performance obligations, and terms including perpetual access. Model licenses and language are available from licensing resources such as Liblicense.[25] Licenses also usually contain other important legal terms, such as *jurisdiction, warranty,* and *indemnification*. Some libraries, particularly public universities and government libraries, are not allowed by their institutions to sign any contracts that contain jurisdiction outside of their own state. Libraries should also be very careful not to sign a contract that holds the library responsible for patron behavior outside of reasonable effort to meet widely agreed-upon standards. It is important to remember that the license is a legal document, and signing something that is not well understood puts the institution in legal jeopardy.

Liblicense Licensing Information
http://liblicense.crl.edu/licensing-information

NISO ONIX-PL Working Group
www.niso.org/workrooms/onixpl

Tracking Licensing Terms in an ERMS

One possible solution to the problem of information availability is the ERMS. Almost any software system could work and be considered an ERMS for licensing purposes, as long as that system contains a complete list of licensing terms, as well as all library subscriptions and licenses indexed with those terms so that they can be quickly found and interpreted. There are several purpose-built software systems designed to track and catalog licenses and to make the information available to any parties within the library who need it.

The main advantage to using an ERMS for license tracking is that it can function as a centralized place to keep all relevant terms from the license. This way, departments that need information, such as interlibrary loan and serials, can simply look in one place for it. ERMSs also frequently come with template licenses to make it easier to map licenses into standard terms. Mapping licenses is time-consuming, but in the long run it can save time and help to prevent problems caused by noncompliance. In addition, ERMSs are generally moving in the direction of more interoperability and compliance with standards, which means that an ERMS may have functionality to easily export terms into other systems or to allow related systems, such as discovery service platforms and ILL systems, to pull relevant license information.

In a survey conducted in 2008, Lisa Boxill Ruth discussed the problems of categorizing and inputting license information with multiple libraries.[26] Tim Jewell, Trisha Davis, Diane Grover, and Jill Grogg led a workshop and published a useful paper on interpreting the licensing terms spelled out in the DLF ERMI report and how to use them when mapping terms from real licenses into the DLF ERMI data structure.[27] Another paper from 2009 suggested that the process of mapping terms and of interpreting licenses would be much improved by a registry of license terms, possibly related to the JISC Registry of Electronic Licenses project.[28]

All the currently available ERMSs have license management capability. ERMSs based in an ILS system are focused on creating license records that can be attached to bib records, with the capacity to upload or link to license PDFs. The fields for license records allow for cataloging license terms and conditions. ERMSs built into a link resolver or A–Z list tend to focus on permissions and integration with interlibrary loan information. Depending on the system, they may also come with license template defaults already built in to aid in cataloging the license.

Reporting

The fifth major piece of managing electronic resources is producing good reports. This includes fairly typical

examples, such as budget and serials check-in reports, but can also include usage statistics for individual journals, entire databases, or all resources from a particular publisher. So many discrete pieces of information are important to making decisions about electronic resources that it is very difficult to compile large reports without available special software functionality.

COUNTER and SUSHI

COUNTER, or Counting Online Usage of Networked Electronic Resources, is a standard defining a format for collecting and presenting statistics to benefit librarians and publishers.[29] The first code of practice covering standards for statistics for journals and databases was available in 2003 and was expanded to include e-books and reference works in 2006. Many journal and book publishers have already adopted COUNTER-compliant statistics, with more implementing it all the time. The COUNTER project makes a code of practice available for vendors when preparing statistical usage data or reports. COUNTER relies on individual vendors, usually either publishers or content aggregators, to adopt the code of practice voluntarily, in which case their statistics are "COUNTER-compliant." Vendor compliance is verified through independent auditing. The code of practice covers content, format, delivery mechanism, and data processing rules for statistics information. Most large vendors have websites where COUNTER-compliant reports can be run and downloaded as needed by the library. Software sold to manage COUNTER statistics generally compiles statistics for multiple publishers together for comparison purposes. Finding out how many articles were downloaded from one journal is helpful information, but it will be even more helpful as part of a report on all the journals from that publisher so that the library can tell which journals have the highest use. This report will be even more useful if all journals from all publishers can be compared together. The COUNTER standard specifies the format for statistics reports and standardizes them, but it is necessary to add these reports together to get a complete picture of the statistics at a given library.

SUSHI, or the Standardized Usage Statistics Harvesting Initiative, is a NISO protocol that defines standards formats and requirements to automatically download statistics from a vendor SUSHI server without the need to log in individually and download each report independently.[30] This automation simplifies the process of gathering statistics for the most frequently used reports. Generally, the library or statistics management software vendor sets up a SUSHI-compliant harvesting server, and the library checks each vendor for SUSHI compliance and for that particular vendor's codes. When the SUSHI download is run, the statistics server connects to the publisher statistics server to download COUNTER report information, such as the JR1 journal report, BR1 for e-book usage, or the DB usage reports.

SUSHI and COUNTER are both widely adopted standards. They are relatively mature, they can be used with or without an ERMS, and many major publishers understand and have adopted them. Many publishers and vendors make these reports available, and they can be manually collated or automatically collected. Most ERMSs have either a built-in or an add-on feature to collect and compile COUNTER usage statistics. This functionality was integrated early in ERMSs, such as those from Serials Solutions and EBSCO, but is currently being implemented in several of the ILS ERMSs, such as Verde from Ex Libris and the Millennium ILS. Oliver Pesch discussed the complex model necessary to look at multiple reports together in a 2011 article including a diagram of all of the interrelated parts.[31] Several library use cases specify that while COUNTER statistics are collected and used at their libraries, COUNTER data alone is not sufficient to capture all relevant information for serials collection management decisions.[32]

While harnessing the full potential of these reports would require combining them with other data, for example print usage or cost data, these standards are already widely adopted and used in collection decisions. The advantage of using SUSHI and COUNTER is the ability to purchase a COUNTER-compliant system, enter necessary information (such as URLs and passwords) to access the reports, and then set up regular SUSHI automatic downloads from the vendor to retrieve the statistics. This process can even be automated in some systems so that reports are regularly downloaded and available when they are needed.[33]

The main advantage to COUNTER-compliant statistics for journals is the availability of cost data, which can be combined into cost per use. Finding cost-per-use statistics is extremely time-consuming and difficult to put together without an external software system. Not only is combining usage data manually difficult, time-consuming, and frustrating, but for many libraries the individually subscribed titles are only part of the puzzle. Right now it is extremely difficult to determine cost per use for all titles purchased through different subscription sources by using these methods. One library attempting this project manually ended up with four different categories: individual titles, full-text databases, publisher journal packages, and aggregator journals.[34] Once these categories are identified, however, challenges in determining use remain. Even something seemingly simple, such as determining the cost per use of an article from a journal purchased in a package, is complex. Should it come from the total price of the package divided by the number of titles or by the number of articles used or by the list price

of the journals, considering that most publisher packages give significant discounts when all titles are purchased? Oliver Pesch has written eloquently on the issues that occur with double counting and possible data collection issues with COUNTER standards and compliance issues.[35]

Since compliance with these standards is voluntary, there are still problems with automation, particularly with the need for the manual downloading of statistics if the SUSHI load fails. A case study from the University of Pittsburgh Health Sciences system shows this is a particular issue for medical libraries, as some medical resource providers are still in the early stages of compliance with SUSHI and even COUNTER.[36]

Advances in technology and standards will lead toward answers to these questions. Technology is moving toward an ERMS that is able to concatenate the data from COUNTER-compliant statistics drawn automatically from publisher sites or uploaded by the ERMS vendor, combine those statistics with the financial data the ERMS was originally created to hold, and use those to give librarians clear, understandable, and accurate financial and usage reports for effective budget decision making. So far, this software is still in development in most ERMSs, but there is lots of potential and great strides have already been made.

COUNTER
www.projectcounter.org/about.html

NISO SUSHI
www.niso.org/workrooms/sushi

Other Kinds of Statistics

Outside of COUNTER, very few statistics standards projects exist to track usage of electronic resources. Oliver Pesch of EBSCO suggested that in addition to COUNTER and SUSHI, licensing standards such as SERU and the I2 Institutional Identifiers standards will have a large positive impact on library statistics management going forward.[37] He also posited that the article-level metrics, including Eigenfactor and other new measures, will become increasingly popular as the trend towards measuring usage on an article level continues. Jill Emery and Graham Stone took this a step further, noting that "many libraries also choose to develop an aggregation of web page statistics, discovery tool statistics, OpenURL usage, and ILS usage to add to the use evaluation of any given title or resource" and that collecting and aggregating these statistics along an extended timeline is an important piece to getting a full understanding of a resource's use in a particular environment.[38] She also referred to the JUF, or Journal Usage Factor project trying to develop additional metrics for journal usage, as well as direct user surveys using metrics such as the LibQUAL+ project.[39] Other examples of creative use of reports come from case studies such as that done by Kerry Chang-FitzGibbon and colleagues at Richard Stockton College of New Jersey, where they reallocated collection money for periodicals based on a combination of cost, usage, and overlap analysis information.[40]

Statistics Conclusion

According to the NISO ERM Data Standards and Best Practices Review, NISO still sees tremendous value in the combination of the CORE, COUNTER, and SUSHI standards for generating helpful reporting information about electronic resources.[41] This conclusion holds true even though questions about data collection and data counting are being asked about the value of cost per use, as Mr. Pesch suggested. Additional issues include big deal packages, making it difficult to determine the true value or price of a particular journal; cost in some fields far outweighing others, making some journals look disproportionately expensive; and the difficulty of collecting and automating data collection. What is clear is that the need for reports is only going to continue to grow, that the standards already in place are extremely helpful but could be expanded and more widely adopted, and that getting a real sense of what is happening with a collection requires going beyond these standards to pull in additional information not yet accounted for, such as website usage and local interest in the title.

Conclusion

The specific system the library uses does not matter as long as the library is able to manage all aspects of electronic resources adequately. The best solution for an individual library will depend on the library's current software setup, staffing levels, areas of concern within electronic resource management, level of support from local systems staff, budget levels and situation, and many other factors. As long as all the information needed to manage electronic resources is collected and available to everyone who needs it through the existing library setup, an ERMS might not be necessary. However, if there is difficulty maintaining and compiling information needed for electronic resource management with the process of managing subscriptions, reporting, administration, and licensing information, or if there is difficulty keeping all these disparate pieces updated and available to library staff, the library may want to consider an ERMS.

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