Open Source Electronic Resource Management System: A Collaborative Implementation

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ABSTRACT

Librarians and strategists at Simon Fraser University (SFU) have collaborated with a team of middle-sized libraries to expand the open-source CUFTS Researcher suite of tools to include an Electronic Resources Management (ERM) system. This paper focuses on: the development and implementation of the CUFTS ERM; interoperability between CUFTS ERM and integrated library systems (Millennium); impact of the ERM on acquisitions, serials, and collections workflows and staffing at SFU Library and the University of Prince Edward Island (UPEI) Library.

KEYWORDS electronic resources management systems, open source, CUFTS, ERM implementation, systems interoperability

The reSearcher suite of open source library discovery tools developed at Simon Fraser University Library (SFU) under the aegis of the Council of Prairie and Pacific University Libraries (COPPUL) is composed of the CUFTS serials management tools, a federated search tool and a citation manager system. The serials management tools integrate with the newly developed CUFTS Electronic Resources Management System. CUFTS is composed of a Knowledge Base, Link Resolver, E-journal database and the ERM.

The CUFTS knowledge base contains over 475 fulltext resources and libraries can freely download the software and set up their own installation, or have SFU host their CUFTS

installation. The CUFTS knowledge base is freely available and downloadable. The title list data that comprises each resource comes from freely available resources such as the publisher's website. The link resolver capabilities of the knowledge base work with various title lists downloaded directly from publisher sites, but some lists do have to be manipulated manually by staff at the SFU Library since the vendor supplied data lacks the necessary bibliographic and date coverage needed. The link resolver, called GODOT, uses the knowledge base to resolve to fulltext and uses OpenURLs, digital object identifiers (DOIs), or its own internal linking syntax, to provide article level linking in all major indexing and abstract databases. GODOT also works with ILL software and major ILS systems to provide direct or mediated ILL requesting for patrons[1]. As well, a Journal Auth table in the CUFTS e-journals database allows for the creation of MARC records which can be loaded into the opac, thus displaying up to date e-journal bibliographic and holdings information by utilizing data already in CUFTS.

Maintenance of certain resources in the CUFTS knowledge base is now done collaboratively between SFU, University of Prince Edward Island (UPEI), and some member libraries of the British Columbia Electronic Library Network (BC ELN) consortium of post-secondary libraries in British Columbia. Collaboration began as an ad hoc process when one college offered to do the significant work required to create a resource in CUFTS since the vendor did not supply any useable data for a link resolver. SFU and other BC ELN members also started collaborating on open access resources and recently UPEI started maintaining certain CUFTS resources such as DOAJ, the journals published by Canada's National Research Council, the Highwire list of freely accessible journals and the resource of Canadian government periodicals. This collaborative maintenance of CUFTS resources is of benefit to all CUFTS users since it lessens the burden on SFU of constant maintenance, allows for a greater variety of

resources to be added to CUFTS, and keeps the already up to date and accurate CUFTS resources even more up to date and accurate. As well, it led UPEI to cease subscribing to a serials management system outside of CUFTS, choosing instead to rely on the CUFTS community to provide this data.

The open source CUFTS ERM, part of the reSearcher suite of library discovery tools, was developed at SFU in collaboration with the BC ELN and COPPUL with input from UPEI. It is extendable and changeable due to its open source nature. The need for centralized licensing data drove the initial need for the ERM. The initial design was drawn from the Digital Library Federation's Electronic Resources Management Initiative[2] (DLF ERMI) and modified in collaboration with BC ELN and COPPUL libraries. Modifications included adding functionality to display or not display data elements to the public, fields to link out to the e-journals database and to the library's ILS, and additional fields for financial and renewal information.

The initial development discussions led to the realization that current workflows at the SFU Library would need to be substantially altered, and this topic will be dealt with in depth later in the article. However, to understand those workflow changes it is important to note that at the SFU Library, the Collections division, not the Serials Unit or Technical Services, was responsible for the management of online serials due to historical reasons. One outcome of ERM development has to move some e-serials work back to the Serials Unit – work such as CUFTS Resources maintenance.

The CUFTS ERM resource record is composed of three main parts: the main record which contains descriptive data, financial data, subscription information and access data such as usernames and passwords; the provider record which contains vendor information such as

contact information and admin module usernames and passwords; the license record which includes the DLF ERMI license fields.

The main record is unique for each resource – each resource in the CUFTS ERM has its own unique main record. Fields in the main record are arranged in a tabbed display according to function. The main record is where the status of a resource is tracked and is the activity area where you will find most of the important data about a resource. It is also where the Provider record and License record are linked from.

Screen shot of the General section of the CUFTS ERM Main Record

Under the General tab is included the basic descriptive information and some subscription information for the resource; under the Dates/Costs tab is further subscription information, internal and external record numbers, and financial data; the Statistics tab is the access information for downloading usage statistics; the Admin tab includes administrative module access information, public usernames, general access information for the resource, access notes fields and vendor contact information; the Subjects tab is for assigning subjects to databases that display in the public display side of the CUFTS ERM; the Links tab is where you link out to the License record and Provider record; the MARC tab is an output of the ERM Main record in MARC format, which is primarily used to populate the order record in the ILS.

The Provider record and License record can be linked to multiple Main records. The License record is based on the DLF ERMI. The Simon Fraser University was able to utilize a co-op student from the Library School at the University of British Columbia to enter the licensing data for the library's e-resources licenses.

Licensing data is displayed in the CUFTS ERM records and also in a special staff view of the CUFTS e-journals database. This allows library staff, particularly Reserves and Document Delivery staff, to quickly view all relevant license data related to a resource in the CUFTS ERM.

Screen shot of the staff display of licensing data from the CUFTS ERM

Development of the ERM continued after licensing data was entered, since license records were separate and could sit on their own, unattached to anything while the rest of the ERM was still undergoing changes during implementation. True to a collaborative project, not all development carried out at SFU is utilized by the SFU Library. For example, with the introduction of the CUFTS ERM, it was decided that to save time and effort that the reference/liaison librarians would use the ERM to maintain the public list of databases and retire the old tool that was used to maintain the public list of databases on the Library website. This was a change in both tools and process. It also presented a case of where a new ERM functionality recommended by partners, namely the ability to describe a resource by the type of

content and to limit searches by this descriptor – for example, labeling image resources with the content type of "images" – was deemed too time-consuming by SFU reference/liaison librarians who would be responsible for the initial description and maintenance. Hence, SFU, the development site, does not use this functionality.

Implementation of the CUFTS ERM at Simon Fraser University

The CUFTS ERM system implementation at SFU followed a classic plan: first, establish initial parameters and go live with data entry; meanwhile, run data-transfers to populate and synchronize the CUFTS ERM system with existing orders from the traditional integrated library system (Millennium).

Initially, a virtual link would be established, so that records in the CUFTS ERM system, where details of the electronic subscription are recorded, could correspond with those in Millennium, where all financial transactions occur. As an order is started in the CUFTS ERM system, it is then processed and paid in Millennium, after which costs data is required in the CUFTS ERM system for statistical analysis. How could the two systems be linked for data transfer or synchronization? The answer would be to code the stable CUFTS ERM system accession number in an indexed local MARC tag (930) of the Millennium record.

Also, in preparation for going live for new orders, a new procedure was adopted to eliminate dual data entry. As Collections staff enter new orders in the CUFTS ERM system, along with their licenses and terms for access, they give the order a "to be ordered" status. Key fields from such orders are then transferred electronically to Millennium, and Acquisitions staff are alerted by email to activate and pay for them in Millennium.

The electronic transfer of new orders resulted in a workflow change as staff rely less on printed forms and ordering information is no longer walked from one area of the library to

another. Other workflows were affected throughout the library (in ILL, Circulation, and even Reference), as licensing and other details for electronic resources which had hitherto been stored in a filing cabinet could now be consulted online. This first synchronization project, a transfer of new orders and alert, was run manually starting in August 2008, and has since been scripted to occur automatically on a weekly basis.

Meanwhile, efforts were under way to populate the CUFTS ERM system with current Millennium orders. First, different types of electronic resources were identified: stand-alone journals, packages, and databases. These types are treated differently in Millennium and are presented differently to the public. Databases receive full cataloging and all formats are cataloged on a single record, whereas brief records for electronic journals are downloaded from title-lists and stored separately from their print counterparts. Each of these resources is represented in a public list of e-journals and e-databases, in addition to the catalog, whereas the orders for packages are suppressed from public view.

The next task involved inserting the linking 930 tag systematically in each corresponding Millennium record. Several processes were run to accomplish this task. Stand-alone journals were identified in Millennium and exported to the CUFTS ERM system to create new records, following which the newly-created accession numbers were imported back to Millennium, matching on the Millennium system number as exported. For databases, whose records were already presented in the CUFTS ERM system, the task involved matching on title in Millennium, with close manual follow-up for problem and failed matches, to insert the linking 930 tag. As for packages, most would be created by hand, due to the frequently inexact correspondence between what is tracked in the CUFTS ERM system and what is paid for in Millennium.

Once the linking 930 tag is present in Millennium records, it can be used for matching, to import the costs data to the CUFTS ERM system for analysis and reporting purposes. The chief

problem encountered in this import involves data-formatting. Costs fields that are not electronically parsed must be entered individually by hand. It is hoped that developments in the implementation of NISO's Cost of Resource Exchange (or CORE)[3] protocol will in time resolve this, and permit a more successful transfer of costs.

In addition to the transfers of new orders and costs data, a third transfer synchronizes databases in the CUFTS ERM system with those in Millennium. This particular transfer highlights an ongoing question: how should records be updated? Which fields should be mapped, and which overwritten? More generally, since most fields are editable, and transfers occur in both directions, in which system is data definitive? A final answer to these questions has proved elusive, although initial transfer parameters have been established and carefully documented for staff reference.

For successful electronic data transfers, it was recognized that the linking 930 tag should be diligently maintained in Millennium. Because of the current practice to catalog electronic journals separately from the print, order records for this type of resource are manually tracked. The linking 930 tag in the bibliographic record is a stable number, but the whereabouts of its orders can vary. Some are attached to the print version and must be manually transferred to the electronic version, while others attached to the electronic version have no apparent relation to the print. Although other situations, such as title changes, also involve manual tracking, moving to a single-record approach for cataloging journals would certainly alleviate the manual work of maintaining the links.
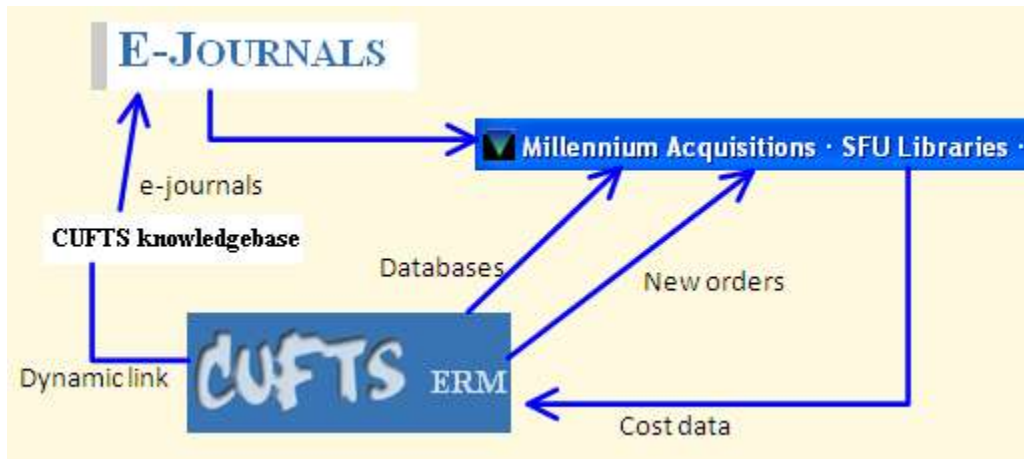
Graphical representation of the data synchronization between Millennium and components of the CUFTS reSearcher suite

In summary, the most ambitious challenge of this implementation has been to synchronize the two systems. Ongoing questions include: how to maintain the virtual linking or correspondence between records, and also, how to synchronize disparate data. However, the synchronization itself has resulted in positive outcomes on both the staff and public sides.

On the staff side, the change has been both functional and attitudinal. As records for electronic resources are centralized and standardized, staff can consult them more easily and manage them more effectively. Also, as staff adopt new strategies, they learn new technical skills for managing traditional print resources.

On the public side, the change is more subtle but no less positive. Searches for electronic resources are more reliable across the three interfaces (catalog, e-journals and e-databases lists). Also, the catalog can be searched comprehensively for both print and electronic resources. Finally, with answers at their fingertips, staff are able to respond more effectively to questions from the public.

Implementation of CUFTS ERM at University of Prince Edward Island

At the University of Prince Edward Island (UPEI), implementation of the CUFTS reSearcher Suite including its new ERM has followed a different course than at SFU. At UPEI, open source technology is an institutional strategy: Moodle and Drupal are used extensively throughout the campus. Robertson Library has a rich history of using open source technology to deliver its technical services and the entire suite of CUFTS products, described earlier in this article, along with the Evergreen ILS plays, an integral part in this strategy. The library also creates and hosts VRE's (virtual research environments), digital repositories, and is currently digitizing local histories.

Part of the appeal of open-source technology is the way in which products can be changed and developed in a collaborative manner. This would become very important to UPEI as they worked with the CUFTS development team (reSearcher) to overcome some of the deficiencies of the Evergreen ILS. UPEI was the first academic institution in the world to implement Evergreen, going live in June of 2008.

In June 2008 Evergreen was not a complete ILS, having neither an acquisitions nor a serials unit. The early implementation of serial holdings was problematic, since only the title information was displayed. Discussions with the reSearcher development team resulted in the creation of two new CUFTS modules which allow UPEI to upload and display their print holdings. After making these changes, UPEI investigated if CUFTS could be modified to manage print journals as well. This too was accomplished by adding one field, the "coverage field" and modifying others such as the "local note" field. Although these modifications required changing the CUFTS database structure, changes were completely quickly. UPEI's work with CUFTS and the accompanying serials workflow transformation has been recognized nationally. In 2009, the Robertson Library received the Canadian Library Association/3M Canada Award

for Achievement in Technical Services for transforming their serials workflow in an innovative manner.

The greatest workflow change that occurred following the implementation of CUFTS concerned the receipt and maintenance of print journals. Staff now log on to their CUFTS account and choose the print journal resource from the list of resources at the CUFTS main screen. Staff can now search for individual serial titles. A search for "*Circulation research*" results is illustrated in the figure below.

Screen shot of a print holdings screen in CUFTS

Serials staff click on the id number of the record they want to update which results in a maintenance screen where serials data can be edited. The "coverage" field is a free-text field used to update holdings which are then displayed in the CUFTS ejournals database (CJDB). The cjdb note field contains important information about journals and displays in red. For example, the veterinary title *Scientific and technical review* is shelved under its French title, *Revue Scientifique et technique* because it is indexed in article databases under this title. The "local notes" field is viewable by staff only and contains information such as routing lists and subscription information regarding specific titles.

Other workflow changes include expanded responsibilities for Collections/eResources staff at UPEI's Robertson Library to include maintaining CUFTS resources and dealing with all e-journal related work – this is work that was previously done in Library Systems.

Evergreen is developing a serials and an acquisitions unit which UPEI will investigate when they are released. Whether UPEI uses these modules or not, especially in conjunction with the CUFTS ERM, depends on how well they fit into the current workflow. If UPEI adopts them, they will collaborate with SFU which has already developed tools for data exchanges between ILSs and the ERM.

Expenditures are currently tracked with a series of spreadsheets the UPEI Library developed which offer up-to-date information on each account. Once invoices are received, the spreadsheets are updated, with the dollar amount shifted from "encumbered" to "paid" and the invoices sent to the business office for payment. Preparing for a new fiscal year consists of sorting the sheets according to which lines are "encumbered" and which are "paid", deleting the titles that have been paid for and keeping the encumbered items. No interaction with the ILS is necessary.

The first stage of UPEI's ERM implementation consisted of combining these financial spreadsheets with others containing administrative information. The information was then entered into the ERM, resulting in a basic implementation. Financial information is now more accessible and useable than ever and makes the task of analyzing e-resource expenditures much easier. Updating financial data in the ERM only also ensures greater accuracy and currency.

Once database invoices are received, they are assigned a fund number by the acquisitions librarian, and passed on to a staff member for further processing. It will be at this point that the information will be input into the ERM system. The creation of new ERM records as well as maintenance of current ones will also be part of this new workflow.

The inputting of licensing information will complete this first stage of implementation. Another positive aspect of on-going collaboration with SFU is the sharing of this licensing information. The plan is to receive flat files of licensing information from SFU for resources to

which both institutions subscribe. Since this data will be exported from the CUFTS ERM, it will easily be imported back into the UPEI installation of the CUFTS ERM. This collaboration may also lay the groundwork for UPEI to share such information with other university libraries on a regional level in the Atlantic Provinces, as the CUFTS ERM has been suggested as a management tool for this information.

Just as at SFU, UPEI interlibrary loan and circulation departments will benefit from licensing information in the ERM. Currently staff consult paper files to determine the eligibility of an e-resource for ILL purposes. This information will soon be accessible electronically and the process made much more efficient. The same applies to the circulation department, as licensing information regarding use of e-resources for e-reserves and in coursepacks will be readily available to circulation/reserves staff. UPEI hopes to utilize the public interface to the CUFTS ERM to make this information more accessible in the future.

Other collaborative efforts may include the sharing of database provider information. The representative of each of the large database companies is the same for all the Atlantic Provinces and sharing this information within the region would represent an efficient and effective way of working together.

Currently, UPEI's Robertson Library has an in-house system for displaying databases which is an alphabetic and a subject listing of databases that works in conjunction with the study guides librarians developed. However, the CUFTS ERM public interface (CRDB), offers faceted searching and also has the advantage of allowing students to search for databases by "resource type" rather being limited to searching only by title or subject.

Adding historical cost data to the ERM is also planned at UPEI. A field in the ERM called advanced costs will receive the uploaded data. To accomplish this, programmers will be

looking at the CUFTS code and writing the necessary scripts to allow for the upload of the

information. At UPEI the data would be exported to spreadsheets for analysis.

Planned Future Enhancements for the CUFTS ERM

Currently, tools found on the main ERM screen allow you to export information on one

or more databases based on a variety of search parameters. The information can be exported in a

number of formats: json, html and csv. For the moment, all of the information about a resource is

exported. CUFTS partner libraries would like to see greater control over this in the form of

canned reports. Simple reports such as the contract dates and prices data for one or more

databases would be helpful.

The Robertson Library at UPEI is responsible for providing resources for both the

University of Prince Edward Island and the Atlantic Veterinary College and consequently a

number of databases are cost-shared between the two institutions. The addition to the cost/date

table of a searchable field reflecting shared costs between institutions or between departments is

another needed enhancement. Plans also include the full implementation of the SUSHI protocol

(Standardized Usage Statistics Harvesting Initiative) -- currently being tested and almost ready

for full production implementation in the CUFTS ERM -- and the ability to upload COUNTER

usage statistics individually instead of using the SUSHI protocol. Finally, a change audit system

is planned which will send out a trigger to alert library staff to data updates, or new records, in

the CUFTS ERM. For example, any new online database records that are added or removed from

the CUFTS ERM would result in cataloging staff being notified automatically for corresponding

updates in the ILS.

The collaborating libraries view open source technology not necessarily as a way of

spending less money, but spending money more wisely. Open source has allowed them to build

staff skill and open themselves up to change. Several workflows have already changed since

implementing CUFTS and the CUFTS ERM, and others will continue to evolve with the full

implementation of the ERM module. The participating libraries look forward to an on-going

collaboration with each other and new libraries to refine and develop the CUFTS ERM.

REFERENCES

1. Stranack, Kevin, "An Open Source Alternative for Serials Management," *The Serials Librarian* 51 no. 2 (2006): 29-39. doi:10.1300/J123v51n02_02

2. Digital Library Federation, "Electronic Resource Management: Report of the DLF ERM Initiative," Digital Library Federation, http://www.diglib.org/pubs/dlf102/

3. National Information Standards Organization, "NISO Announces Cost of Resource Exchange (CORE) Protocol as a Draft Standard for Trial Use," *National Information Standards Organization Press Release*, April 1, 2009. http://www.niso.org/news/pr/view?item_key=6395e18858981a8113beb1ddc8f6593bd83e840c

Contributor Notes

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