

RETURN OF THE ILS: CONSOLIDATING THE MANAGEMENT OF E-RESOURCES AND THE DEVELOPMENT OF INNOVATIVE'S ERM MODULE – Scott Nicholls

The migration of resources from print to electronic has been occurring at an exponential rate within libraries since the late 1990s. This has presented libraries with challenges on a number of fronts. Electronic subscriptions require new administrative data to be recorded and managed such as licensing, access, and support. Traditional Integrated Library Systems (ILS) have been designed around physical resources and have to date been limited in handling other types of data. They also need to track holdings information in an environment where the library does not actually receive any physical issues. This problem is exacerbated by the volatility of electronic journals, especially those in aggregations. It was against this back drop that the University of Western Australia Library in 2002, along with several other libraries around the world, entered into a partnership with Innovative Interfaces to develop an Electronic Resource Management (ERM) module. This application was designed to integrate with the Library's ILS and provide a central point for managing e-resources. It introduced new record structures developed to capture administrative data, such as license information and e-serial holdings data from services like SerialsSolutions. This paper reports on the development of the ERM and how it is being implemented at the University of Western Australia.

Electronic Resource Environment

Between the years of 2001 and 2003 the University of Western Australia's number of electronic journals went from 9357 to 37,339, an increase of approximately 300%. During the same period the number of print journals handled by the Library decreased by approximately 19%. These types of statistics are not unique to UWA. The 2003 annual periodical price survey published in the *Library Journal* stated that "at the typical academic library, the rush to online-only is accelerating" (Van Orsdel & Born 2003, p. 54). This is set to accelerate further with electronic books poised to enter the adoption phase.

The new electronic environment has been a boon to library users as they take advantage of desktop delivery and 24 hour access. However, for libraries it has presented major challenges. Electronic resources are complex to manage. They are typically characterised by varying pricing models; a range of stakeholders (including agents, consortia, and publishers); licensing conditions outlining among other things how the resource can be used; changeable title lists if the resource is an aggregation or bundle; and access and authentication issues. Each one of these requires a new set of metadata to help libraries effectively manage them. Some of this metadata, as is pointed out by authors such as Marshall Breeding (2004), can be handled by existing ILS using the traditional acquisitions module and MARC records populated with a URL in the 856 field. However, as Breeding goes on to point out, a typical ILS also "lacks some of the needed features [to manage electronic resources] due to an orientation toward print resources" (2004, p. 25). In a print environment data such as the number of concurrent users, the renewal date of the license and whether the resource can be delivered to remote clients is not required, and hence, the ILS does not cater well for storing this information.

In addition to the requirement for new types of metadata the electronic resource environment has also created a need for change in how resources are processed. The traditional acquisition and cataloguing model was based very much on the manual processing of physical items on an item-by-item basis. However, this model came under serious pressure in the late 1990s when publishers and aggregators begun offering “big deals” which gave libraries the opportunity to purchase entire collections at affordable prices. Almost overnight Cataloguing departments were faced with the prospect of having to provide title level access through the catalogue to collections containing hundreds of journals. The process of creating bibliographic records one at a time with embedded 856 links to achieve this was labour intensive. On top of this, the process of maintaining these links as collection coverage and titles changed was an even greater challenge.

Integrated Library Systems have been slow to respond to these challenges and this led to many libraries embarking on the development of their own internal systems for managing electronic resources. Some of these have been well documented in the library literature such as Penn State Library’s Electronic Resources Licensing and Information Center (ERLIC) and MIT Library’s Virtual Electronic Resource Access (VERA).¹ According to Marshall Breeding (2004), these types of management systems fall into two major categories. Those that deal with “the front end details of delivering content to Library users” and those that are for “managing the business details of back end staff functions related to acquisitions, payment, and licensing” (2004, p.25). At the University of Western Australia, as with other libraries, a number of systems were developed which can be understood in terms of Breeding’s categories. The major one was a service called the “Information Toolbox” which dealt mostly with front end details. This was built as an Oracle database and provided Library users with a browseable and searchable list of key electronic resources. As such it served primarily as a discovery tool. Each electronic resource had a range of metadata including a brief description of the resource, details of which client groups were allowed access, and links to support documentation such as training guides. In addition to this, there were a number of systems developed to handle the back end data. These included an array of spreadsheets recording key license conditions for resources, Library staff web pages recording password information, and print filing systems storing original license and offer documents. Sitting alongside all of these systems was the Library’s ILS which was populated with title level links to all the Library’s electronic resources. These links were populated and maintained on a record by record basis by cataloguing staff. The ILS also contained the acquisitions module which managed the financial aspects of the subscriptions.

While many of these in-house systems ended up as quite sophisticated applications which went some way to assisting with the management of electronic resources, there were a number of underlying problems with them:

- Having multiple data management systems made it difficult to create and maintain information about an electronic resource. Accessioning a new electronic resource meant populating several different systems with data and was an overly complex process involving a multitude of staff.

¹ An overview of these systems can be found in Kennedy, M.R. 2004, “Dreams of perfect programs: managing the acquisition of electronic resources”, *Library Collections, Acquisitions, & Technical Services*, [Online], vol. 28, no. 4, Available from: <http://dx.doi.org/10.1016/j.lcats.2004.08.005> [26/11/2004].

- There was duplication of data between the systems which made the maintenance process inefficient. Changes to data would often need to be updated in several places.
- It was difficult for staff and client groups alike to find and access information about an electronic resource when required. In effect metadata was spread across too many systems and it was confusing as to which particular system held which bit of data.
- The various systems only had limited potential to link to each other and share data. So, for example, license information held in the Information Toolbox about a particular aggregation could not be displayed on the bibliographic record held in the catalogue for a title belonging to that aggregation.
- There was still a great deal of information which was not being captured by these systems such as key local contacts for an electronic resource subscription.
- The system relied too heavily on manual processing of individual items and meant the Library was too slow in being able to deliver and maintain access to large collection sets.

By 2002 it was obvious that changes were required in order to overcome these problems. The Library needed to consolidate these management systems into one and had to introduce automation and batch processing into the workflow. It was at this time that the opportunity arose for the Library to join in a partnership with its ILS provider Innovative Interfaces in the development of the Electronic Resource Management module.

Development Partnership

The ERM development began in May 2002 and included as development partners the University of Washington Libraries, Glasgow University, Ohio State University, Washington State University, and the University of Western Australia. The development progressed through three main stages:

1. Data specification: Each library submitted the specific data elements it required from an electronic resource management system. These were then collated by Innovative and a negotiated set of data fields was established. Work was also carried out over the term of the development to synchronize the naming and definition of these fields with the electronic resource data specifications being developed by the Digital Library Federation (DLF) at the same time.²
2. Scenarios: Libraries submitted written scenarios on how they thought the data elements would be used. This helped delineate the purpose of the data as well as providing Innovative with useful insight into the functionality required in the ERM.
3. Testing – Innovative built a prototype ERM for the development libraries to test. This gave them the opportunity to provide feedback with regard to data elements, functionality, and technical problems.

Communication among the development partners and Innovative was managed through a listserv as well as monthly round table meetings carried out via teleconference and

² See <http://www.library.cornell.edu/cts/elicencestudy/dlfdeliverables/home.htm> for more information about the standards work being carried out by the DLF

WebEX. The development partnership finished in August 2004 with the general release of the ERM module from Innovative.³

Innovative's Electronic Resource Management Module

The ERM is a module which is delivered via Innovative's Millennium system and is part of a broader suite of Millennium products which includes the Cataloguing, Acquisitions, and Serials modules. The ERM performs a number of functions.

ERM Metadata

Firstly, it provides a system through which libraries can centrally store metadata relating to electronic resources. This includes data relating to licensing (such as who can use a resource and what it can be used for), access (such as information about special software requirements needed for access and links to training guides), and administration (such as who the key stakeholders are and links to usage statistics). There are over 90 new data fields available in the ERM and these have been developed with enough flexibility to capture information relating to all types of electronic resources including electronic journals, electronic books, and electronic databases. These data fields can be selectively displayed in the WebOPAC depending on library requirements.

Record structure and architecture

The ERM data fields are delivered through three new non-MARC record types: resource, license and contact records. The central record is the resource record which acts as the umbrella or parent record for electronic resources (see figure 1). It captures metadata relating to description of the resource, access, and administration. Attached to the resource record is the license record which captures the key information from a license. The final record type is the contact record where the contact details of key stakeholders in an electronic resource can be stored such as the access provider or consortium.

³ A more detailed description of the ERM development partnership is given in: Grover, D. & Fons, T. 2004, "The Innovative Electronic Resource Management system: a development partnership", *Serials Review*, vol 30, no. 2, pp. 110-116.

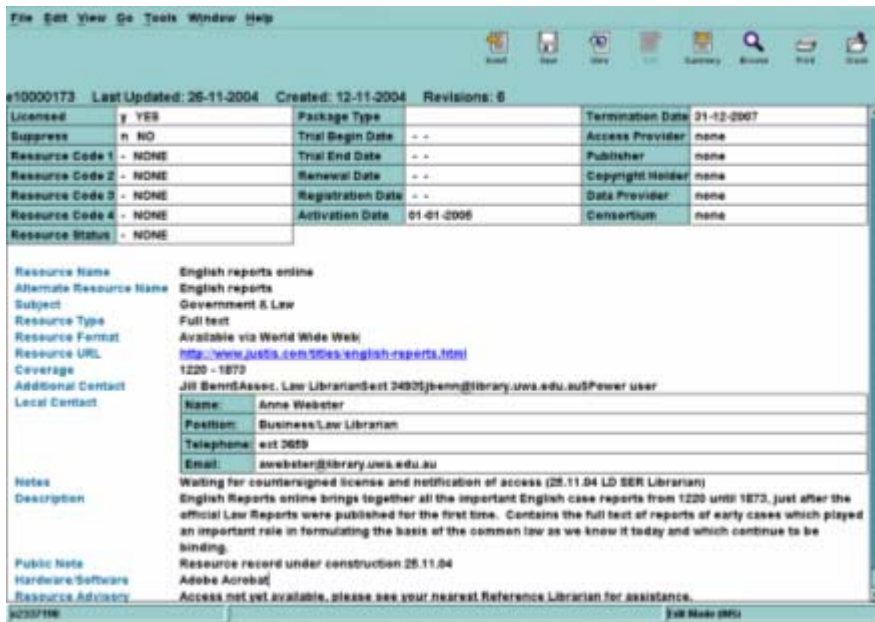


Figure 1: Staff view of resource record

These three records are delivered as part of the ILS and are integrated with existing record types like the bibliographic and order record. In order to accommodate this coexistence a new architecture has been developed which allows for parent-child relationships to be built (see figure 2 which illustrates the basic record relationship of the ERM). That is, it allows for resource and license records to be linked to related bibliographic records. This means if a resource record is an aggregation or full text database it is possible to link it to all the related titles which are delivered as part of that collection. This provides enormous benefits for staff and students who need to access data about an electronic resource. Through this architecture they can now view a catalogue record such as a journal title and be able to link quickly to all the resource, license, and contact information pertaining to that title. Similarly, it is possible from the parent resource record to view all the related titles, license, and payments which are part of that resource. As such, the ERM can be used to capture the many intricacies of electronic resource subscriptions where complex relationships can exist between the electronic resource, its component titles, payment, stakeholders, and the various licenses which may be presiding over the subscription.

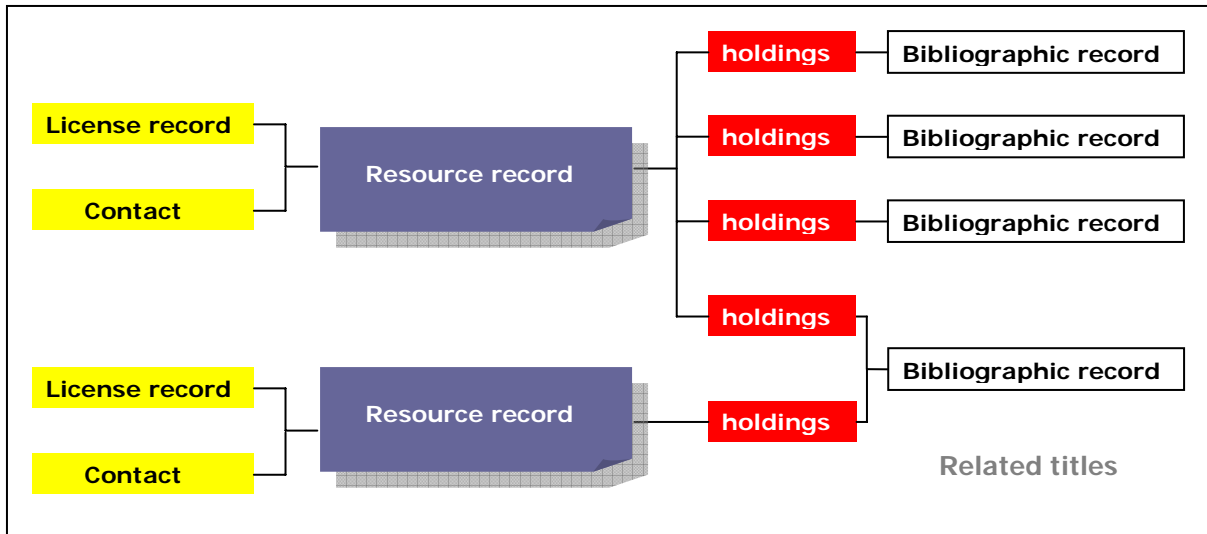


Figure 2. ERM record relationship

ERM alerting

The ERM also provides the capacity to set email alerts to prompt Library staff when they need to action in some way a resource. These alerts can be set at two levels. The first one is at the resource level where staff can nominate a date to be contacted about a specific resource. When that date is reached they are notified via email with information about the resource to check. The second is at a general level where staff can request the ERM notify them with all resources which are about to reach a critical date. This could be, for example, a regular email listing all titles which have a renewal date within 60 days. This type of functionality is critical in the electronic environment where the renewal or cancellation of subscriptions is often bound by certain time conditions specified in the license. By being able to be notified well before these conditions come into effect means decisions can be made and acted upon.

Eholdings maintenance

Perhaps one of the most powerful and potential time saving components of the ERM is the coverage database. This is designed to store all of a library's eholdings information including data such as the electronic title, isn, coverage start and end dates, and the title level URL. This information has traditionally been stored as part of the 856 in the bibliographic record. However, the ERM takes the management of this data out of the bibliographic record and into a separate database. By populating the coverage database with eholdings data it performs two main functions. To begin with, it uses this data to build the relationship or link between a resource record and its related titles. It then populates a holdings record attached to each related bibliographic record with a title level URL in the 856 and coverage information drawn from the coverage database. To this extent, eholdings data is not stored in the holdings record but rather "soft linked" to the actual data in the coverage database.

The coverage database matches with records in the catalogue on isn and then title. Where it finds a match it creates a holdings record and attaches it to the appropriate bibliographic record. This then provides the link between the resource record and the title as well as providing the 856 link to the actual electronic journal or book. If a match is not found it is reported or alternatively a brief bibliographic record can be created.

Critical in the use of the coverage database is the way in which a library sources its eholdings data and MARC records. For eholdings data libraries have the option to build this themselves from their various vendor's eholdings spreadsheets or else they can opt to source it from one of the third party eholdings vendors who have emerged such as SerialsSolutions. MARC records can also now be sourced in batch from a number of vendors including Kinetica. These can be pulled into the catalogue en masse using load tables within Millennium and used to match against.

The coverage database operates by a library loading and reloading eholdings data on a regular basis. Each load will report where no matches have been found and MARC records for these will then need to be sourced and batch loaded into the catalogue. The load will also report where titles were present previously but are no longer there. These indicate titles which have been removed from a collection and as such should be removed from the catalogue and coverage database.

This batch processing makes it a lot easier to manage electronic holdings. Rather than having to make changes on a title-by-title basis all changes can be detected and fixed in one process. It also means library's such as UWA who have chosen to maintain a single record in the catalogue to record all print and electronic holdings can continue to do so using the coverage database.

Relationship of the ERM with OpenURL and Portals

Ultimately libraries only want to manage their eholdings data and electronic resources metadata in one place. To this extent, the ERM has potential overlap with emerging technologies such as OpenURL resolvers and portals which also store and use eholdings and eresource metadata. At this stage given the absence of any real standards for eresource metadata it appears that these systems will not seamlessly integrate with each other, unless using all products from the same vendor. However, in the absence of this there may be potential for data to be stored in one system and then exported to another for use. In terms of eholdings data, this could mean storing eholdings data in the OpenURL resolver and exporting it to the coverage database. A critical factor in this though is how the title level URL is generated which is needed to populate the coverage database. Typically, a title level URL is not stored in an OpenURL resolver but instead is generated by OpenURL itself. Similarly portals have brief descriptive elements that are duplicated by ERM fields such as title and description. Ideally it would be useful to be able to export this data from the ERM to populate the portal. It would also be ideal if the brief resource record in a portal could link to the more detailed resource record in the ERM. These are all issues which are being investigated as part of the implementation of the ERM at UWA.

Issues for implementation

The implementation of the ERM will be no easy task. It requires both a change in how libraries source, store, link, maintain, and integrate data as well as a process of dismantling or migrating to the ERM whatever in-house systems have carried out these functions previously. The University of Western Australia is in the very early stages of this process and is anticipating a 12 month implementation period. Considerations being looked at as part of this implementation include defining data standards for the 90+ new

ERM fields; creating new workflows for populating the ERM with data both retrospectively and in an ongoing capacity; digitising licenses for linking from the ERM; building the coverage database; defining the display of resource and license records in the WebOPAC; and integrating the ERM with other systems such as OpenURL, portal, and EzProxy. The ERM will be built on a resource by resource basis and as such will be rolled out to students and staff gradually.

Conclusion

The development of the ERM by Innovative is a significant first step in assisting libraries regain control of their electronic resources. It consolidates the management of electronic resources into one spot while at the same time returns this process to the fold of the ILS where all other information resources are managed. It also provides new solutions for being able to take advantage of library automation through the batch management of electronic holdings data. With the development of such a resource by a major vendor also comes the possibility of moving toward greater standardisation and interoperability of electronic resources information. The fact that the DLF data specifications have been used as part of the development indicates willingness by ILS vendors to try and meet emerging standards and is an encouraging sign for libraries. Ultimately, as Tim Jewell points out in a recent article in *Serials Review*, libraries want interoperability which allows “data to be migrated from one ILS to another; for vendors, publishers, and PAMS to be able to share data; and for members of a consortium to share data, library to library” (Hepfer, Kasproski & Davis 2004, p. 237).

References

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Van Orsdel, L & Born, K. 2004, “Periodicals price survey 2003: big chill on the big deal”, *Library Journal*, vol. 128, no. 7, pp. 51-56.