

Sirius - essential navigational aide in a complex information environment

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Abstract:

In July 2001 UNSW Library went to tender for new library systems. UNSW Library was looking for not just a traditional Integrated Library Management System, but a set of systems and tools that would enable the Library to best meet the needs and requirements it saw critical for the rapidly changing scholarly information environment of the 21st century. Sirius is the name given to this new tool, the ExLibris Metalib and SFX applications. This paper describes the philosophy, aims and implementation issues behind what the Library sees as the key tool/system in providing seamless integrated access to print and digital resources within a resource discovery and portal environment.

Where we were coming from...

It is worth outlining the background and context to the procurement of new Library systems at UNSW Library in order to better understand what the Library's expectations were, and are, for service and resource delivery, and how the new systems are used to meet these requirements.

Prior to the new systems implementation in December 2002, the Library had relied on an essentially homegrown collection of systems. These included:

- a catalogue based on database software purchased in the mid-1980's. The Library had access to the source code
- a third party acquisitions and serial management module
- circulation and course reserve modules developed in-house
- ABN and Kinetica were used as the cataloguing client
- a large number of freeware databases used to support access and management functions i.e. electronic resource access and support, bookings system, interlibrary loans, staff directory, faq etc.

This may all sound like a nightmare, particularly for the user community. However, the systems were 'glued' together using a creative approach and clever programming at the back end, so it all looked and behaved like any integrated library management system. In fact at the user end, it was a very good and flexible 'system'. There were problems, mainly to do with maintaining the variety of systems used and the difficulty of developing new systems to fully utilise the complexities of new information technology and the potential of web services.

All this came to a head by years 1999-2000, and it had nothing to do with the perceived IT Armageddon around Y2K!! The Library recognised it needed to procure the funds for a new system as a matter of urgency, but had to convince the University that it needed a one off special grant as it could not support such procurement from its recurrent funding base. A decision taken at the same time was that, as availability of funding was 2-3 years away at best, the Library had to develop a web OPAC of its own as an interim measure. It was becoming embarrassing for a University Library not to have one! The fact was that with the increasing availability of electronic resources - particularly ejournals, the situation was leading to the development of two disparate systems - one for the electronic, and one for the traditional print. It was getting confusing and frustrating for the users. Furthermore, UNSW Library was at the vanguard of developing new models for acquisitions of e-resources, analysing usage and providing effective access systems to these resources, plus developing very effective information and help support systems in this new environment. Those working in this area, including the authors, wanted to integrate both the electronic and traditional resources into one environment, including the developing support and help services.

The local web OPAC development - the webCAT project - was to provide a great opportunity to experiment and develop a framework for integrating and delivering resources and services over the web, not thought possible until then. Design work began with energy, enthusiasm, creativity -

and most importantly, programming expertise. As there were no real restrictions, apart from technical limitations, all that was possible was achieved given the resources available.

The webCAT had only a short life: February 2000-December 2002, however, it became quite a significant tool for the UNSW community and had a major impact in defining the requirements for the procurement of the new systems. The webCAT experiment allowed the Library to integrate all of its resource base - whether electronic or print; providing multiple access to the same e-resources via different aggregators; all e-resources - databases, e-journals, web pages, websites, subject guides, digitised exam papers, and so on. Furthermore, reporting of resource access problems and status, and other feedback systems were fully integrated. Another key experiment was the concept of providing course/subject specific service within the webCAT - what later was to become known as 'portals'. This led to the concept of 'MyCourse' - delivering all course support materials by way of a course code - these resources were a mix of all the above and included not only resources required by lecturers, but resources the library thought useful for the course, including links to handbooks and other faculty and course web pages. The MyCourse system was eventually superceded by the new systems software but the success of the concept encouraged UNSW Library to implement a similar system for electronic resource access. At some point it was also decided to abandon the concept of 'electronic' resources and use 'information' resources. Identifying resources by format was becoming redundant.

Where we thought we wanted to go...

As happens, an opportunity presented itself, and was taken. This provided the funds for the procurement of new library systems. It has to be said that this would not have been possible without the crucial support from a number of senior University executive officers.

The background outlined above provided the Library with the knowledge, experience and insights to develop a tender document that did not rely solely on a set of technical specifications, but described and scoped a set of tools or systems the Library wanted to implement in order to deliver its resources and services.

The tender document, and the whole procurement process, was given the title 'UNSW Library - Information Resource & Access Management Systems'. The overall aims of the procurement was to identify a web-based information system, or systems that would provide the UNSW community with:

- “integrated access, independent of time or place, to digital and print information resources to enhance the learning experience and support the University’s teaching activities”
- significant benefits to “researchers by providing, through one interface, direct access to both traditional and emerging forms of scholarly communication” [IRAMS, 2001].

Just to be sure, a conceptual diagram was included as well! [see Appendix 1]. The document went on to describe a number of components in a deliberate hierarchy. The components were:

- the Information Access System [IAS]
- the Library Resources Database [LRD]
- the Digital Object System [DOS]
- other components that made up a traditional ILMS.

The IAS was flagged as the most important element, and is the subject of this paper.

The IAS was described as the “key tool for provision of seamless and integrated access to print and digital resources” and would help the Library “move from a traditional collecting to an electronic access paradigm” and would combine “elements of scholarly information portals and meta-searching tools” [IRAMS, 2001].

There were not a lot of systems/applications in production that easily matched these requirements/expectations. Ultimately, after a period of intensive evaluation, UNSW Library chose all Ex Libris products as best able to meet its needs. The Metalib and SFX products were chosen to meet the hopes described in the IAS - which went live together with the ILMS components, and is called ‘Sirius’.

The implementation of Sirius/SFX

The Library named the Ex Libris Metalib component "Sirius" after the prominent navigational star and the first British supply ship for the new colony in Australia. Sirius is basically a "portal" or gateway - a web site that systematically organises a number of different resources and provides an integrated and common interface to access those resources. The specific features of Sirius include the ability to:

- Locate resources by subject area, resource type or keyword (title, description, subject, all fields)
- Search up to 8 bibliographic databases with the one search query and list results in a common format
- Select resources for your own Account and have them appear as the default when you login
- Save your search queries to your Account and rerun them on command or have them regularly sent as Alerts to your email address
- Save selected items from your search results to your Account for future reference and bibliography creation

SFX is another Ex Libris product that is integrated within Sirius, providing full text access and other types of context-sensitive services. It is based on the OpenURL standard. SFX works by using the metadata associated with bibliographic references to provide links to related information

and/or resources. The number and type of services provided via SFX is dependent upon a number of pre-determined factors including the type of resource and the metadata that is available.

For example: A researcher may locate an article in Sirius or an individual database. An SFX button is provided in both these interfaces for the specific article. When the user clicks the SFX button they are provided with further links. The links may be to

- a full-text version of the article
- a local or combined catalogue search for the journal record relating to this article
- a document supply service
- a search for keywords from the article title using a web search engine
- a feedback form to the local library
- an author or author-cited search of a database

Potentially, at no stage does the user have to redo their search or re-enter details about the individual item to access the related service. Using the OpenURL standard details such as volume, issue nos, starting page, ISSN, author etc are automatically processed according to pre-determined criteria. These criteria are formulated by Ex-Libris (monthly updates) and the local library.

The Sirius/SFX system is different to traditional methods of electronic resource access in that it is essentially using a broker (Ex-Libris) to organise and configure data from publishers/suppliers for use by libraries. Traditionally, libraries have dealt directly with suppliers and publishers, and produced lists or records of the resources supplied by these organisations. Ex Libris provides a service by adding value to the supplier/publisher product. The effects of this added value allow libraries to

- provide an integrated resource location, access and management tool
- provide a common search and results display interface to different resources
- provide integrated access to all possible versions of the article
- provide seamless access to related resources/services independent of the interface used to locate the resource

The implementation process

UNSW Library was not the first Australian library to implement the Metalib and SFX products - the University of Technology, Sydney and Curtin University of Technology went live with Version 1.5 in 2002. We were the first to implement Version 2.0 of Metalib, which was significantly different to earlier versions in offering increased functionality (in particular, a new e-journals/SFX listing) and a totally revamped user interface design.

We looked at other implementations, both in Australia and overseas, and decided that we would attempt a different formulation of Metalib, partly because we were using the new version but also because of perceived differences in our access philosophy.

We noted that many libraries had limited their approach to include electronic databases only. We were particularly interested in utilising the resource type definition function and the ability of Metalib/Sirius to handle non-database e-resources to encourage a more varied use of resources by users and promote the work done by subject specialist librarians in identifying important resources.

It was our intention to use the full portal function of the system to promote lesser-known information sources, including non-subscription resources to our users.

The Sirius Group

The Library established a management team called the Sirius Group to oversee all aspects of the implementation of the Sirius system. The group was composed of:

- the Web Services Manager (co-ordinator)
- a Senior Serials librarian (also the Library Datasets Co-ordinator)
- representatives from each of the 5 specialist subject libraries
- a cataloguing librarian
- a systems officer from our Information Technology Support Unit.

The Group met on a weekly or as needs basis. The function of the group was to:

- organise data collection and implementation
- investigate and implement display options
- identify policy areas and propose policy solutions.

The group was quite deliberately skewed towards information services staff, who had the necessary daily contact with the library patrons and experience in providing access to resources. This ensured that access issues remained the principal focus of the group; this was to be reflected in the system's design and configuration.

Data collection

The Library firstly had to identify and collate extensive data about resources that it wanted to include in the system. This included:

- bibliographic databases of book and journal articles
- electronic reference resources including dictionaries, encyclopedias, maps, patents standards, statistics, and handbooks
- fulltext e-books and e-journals
- selected web resources including search engines, organisation web sites and web gateways
- UNSW Library subject guides.

This was done using data from existing databases of resources.

In addition the Library had to identify and configure electronic resources in three different categories: SFX Sources, SFX Targets, and Sirius z39.50 databases. This was achieved using information provided by Ex Libris, resource publishers/suppliers and our own local management systems

User analysis

The Sirius Group identified a range of library users through Library liaison, student groups and web advertising. Care was taken to include representatives from a range of different subject areas and educational/research levels. Controlled (demonstration provided) and blind (no demonstration) user groups were used to determine system acceptance & user perceptions.

Results were generally positive, indicating an understanding of the functions of the system and how it was used. The personalisation features were specifically noted by several users. It was also significant that the blind group reported greater difficulty in realising the features of the system. From this, it was surmised that although the functionality was useful to users, the interface might not be intuitive enough in making the features of the system evident. High levels of training support and documentation were planned to coincide with the system launch.

Identification of staff roles

One of the major tasks of the Sirius Group was to determine who in the library would carry out essential maintenance and development roles in relation to the new system. The new system involved a wide range of library staff working in different areas. Because of the nature of the system and its position outside traditional library tools there was considerable debate as to who did what in the new system. Library management indicated that it favoured a distributed approach to system maintenance.

Overall management

The overall management of the implementation was assigned initially to Web Services and later to the Online Services Department (a new department with overall responsibility for online and web services, digitisation, and a wide range of electronic access areas as well as cross Library project development responsibilities; see separate paper on the new department by Wells, Cargnelutti, Talmacs, VALA2004).

The Serials Department made a very strong bid for this role based on the central role of the serials unit in maintaining contacts with suppliers/publishers and processing data about e-journal and database subscriptions. Library management confirmed their intention to have the implementation based from an information services access viewpoint rather than processing.

The effective implementation of any new system requires the development of new processes and workflows that may not correlate with existing practices or work cultures. The library has the option of trying to bend the new system to fit the work environment or change the work environment to fit the new system. Neither is particularly easy to do. We found that to work effectively the new system required an access-oriented distributed control model. The co-

operation of staff from a variety of different areas, each bringing their expertise to the maintenance and development of the system was essential. Access to the management software is not restricted to a single department. The success of this model is largely dependant upon the development of new communication and authority channels, many of which may run across existing long established practices. Support of management, library staff and time are necessary to implement these new working structures.

Maintenance of metadata about Sirius resources

Each resource in Sirius is supported by metadata describing the resource. Example: alternative names, subject categories, keywords, description, coverage, time span, search hints. Traditionally, metadata about resources has been controlled by the cataloguers using traditional classification and description tools such as Library of Congress. However the metadata required in this case, particularly to support some of the Sirius search functions, was not well suited to these traditional tools and there were also several metadata elements (i.e. search hints, alternative name), which were best supplied/maintained by information services librarians. For this reason the metadata is directly maintained by information services librarians using free text and partially controlled site-specific vocabularies.

Processing of updates/revisions

The successful operation of the Sirius/SFX system is highly dependant upon the accuracy of the data and configurations entered into the systems. In reality the frequency of changes in journal subscriptions and resource URLs is high and therefore constant maintenance of the system is necessary. Ex-Libris provides monthly updates on changes in these areas but obviously in the electronic environment users expect links to be locally maintained on a more regular and immediate basis. Consequently, it is vitally important that the serials processing unit have as much access and control over data as possible. The system is however quite complex in operation and requires a high level of experience and understanding in such areas as SQL and UNIX, skills not traditionally held in the serials processing unit. In order to overcome this a high level of communication and co-operation between serials processing and systems support staff has been necessary. Ex-Libris are continually making improvements in this area by providing more user-friendly reporting and management tools in accordance with system user requests. We are also looking to develop in-house management systems/processes that carry out procedures necessary to the specific needs of the serial processing unit.

Configuration of resources

There are a number of areas of the system that require local configuration. SFX targets require specific information about our subscriptions (i.e. URLs, CrossRef use). Serials processing is predominantly responsible for this area. SFX Services require configuration with appropriate linking formats and display logic (i.e. what services appear for what resources). The Web Services Manager is predominantly responsible for this area. Sirius z39.50 resources require configuration to account for variations in data elements used in supplier references. As UNSW Library have not as yet tackled many z39.50 configuration issues (our experience has been that the default and monthly updated Ex Libris configurations are not a significant source of access problems) this area remains unresolved. Over the next 12 months we plan to tackle developing more experience

in this area and there is an argument, because of the need for searching knowledge in this area, for information services librarians to have significant input.

Categorisation of Sirius resources

Resource Types

UNSW Library has taken a broad approach to the range of resources that it has included in the system. Although the functionality is certainly geared towards electronic bibliographic databases and journals it can be equally applied to other electronic resources, particularly web pages. This presents a particular challenge to libraries where the focus has been on maximising use of subscription resources. This emphasis is not user centered in that it tends to highlight what we own rather than utilising the whole range of resources available to users. To this end we have included a large number of non-subscription Internet sites in our Sirius collection, principally in the areas of non-bibliographic databases, newspapers, organisations, subject guides and search engines. The library had already developed resource lists in these areas which were delivered using an independent system and interface. A set of evaluative criteria had been used to identify relevant resources (<http://www.library.unsw.edu.au/criteria.html>) with an emphasis on established, regularly updated and high value sites.

Types of database

One of the major questions arising from the development of electronic resources has been "What is a database?". As a fairly generic term "database" has been used to encompass a wide range of data collections including full text and abstract bibliographic collections, indexes, encyclopedias and numerical data collections. However there are big differences between these types of resource, both in terms of the data they contain and the uses to which they can be put. These differences are blurred in the electronic environment. Even librarians with a working knowledge of the resources, are unclear about these distinctions or their effect on users. Generally users have an even less precise understanding of the distinctions; to many a database is simply something with a search engine.

Traditionally, UNSW Library, like many other libraries, has collected all electronic data collections under the term "databases". It was felt, however, that there was some benefit to the user in identifying relevant resources in Sirius, if we could provide some distinction between different types based on the type of data they contained. In Sirius it was decided to call bibliographic databases -- "databases" - whether they were abstract, citation or full text. It was felt that, for the majority of library users, this was the major type identified as a database. Other databases would be included under specific types based upon the type of material included such as "standards", statistics, theses, encyclopedias, dictionaries etc.

Subject categories

In Sirius we were able to assign searchable subject categories to each resource as an aid to identification. This was seen as a significant tool for information services librarians in providing their specific subject knowledge as a guide to users.

Traditional classification systems often require a significant knowledge of the subject, its terminology and synonyms. This is absolutely necessary when you have a collection of the size of a normal library catalogue, but for the purposes of Sirius we required a less fine-grained choice of subject areas that was relevant to the normal user and suitable for standard web display functions. The Sirius Group looked at several models, including using the names of University faculties (eight) or schools (one hundred and fifty five) as subject categories. Neither of these was acceptable. Eight faculty categories were not enough and produced result lists that were too long and diverse. 155 school categories were too many and produced drop-down lists that were too hard to use on a web screen and too hard to maintain in practice.

In the end it was decided that an arbitrary number of approximately twenty four subject categories would provide the best balance of subject coverage and screen usability. Group members were asked to provide nominated lists on a library-wide approach. These lists were compiled and eventually reduced to an appropriate number based upon the

- number of available resources/subject
- user understanding of terminology
- subject coverage of the University's teaching/research programs.

Multi-disciplinary resources

Another consideration was how to treat multi-disciplinary resources such as APAIS, PQD5000 etc. These resources are often heavily used, particularly by undergraduates. Should we include them in all categories or just in a single category called multidisciplinary? Unfortunately multi-disciplinary is not a very user-friendly term. Students who view the subject category selection options are looking for subjects and less inclined to think to look in multi-disciplinary. On the other hand, to include all multi-disciplinary resources in all categories would add a large number of resources to each category and in many cases these resources may not be high-usage resources for that subject area.

In the end it was decided to take a balanced approach. We would have a category that would include all true multi-disciplinary resources but we would also include multi-disciplinary resources in selected subject categories where it was known that the resource was a significant source for users in that subject area.

Functional design

Effect of cross searching on databases

One of the most contentious points of discussion in the Sirius group was the effect of Sirius on resources with restricted usage licenses - i.e. databases with simultaneous user limits. We already recognised that some databases were under pressure because of low simultaneous user licenses in the pre-Sirius environment. It was suspected that individual resource usage would increase as the subject category option made some resources more visible and as the multiple search function encouraged quicker and easier database searching. Any improvement to service by increasing user access may have been negated by the limitations of our current licenses. There was some

discussion of disabling the searchability of some resources. Unfortunately the resources of most concern were those who were most likely to benefit from the functionality of the new system, particularly cross-searching. To have not included them would have been to negate the whole point of the system. Our experience, while not realising the worst of our fears, has shown that the new system does affect patterns of usage which will have a flow-on effect to subscription management and costs. The library is monitoring this situation and amending user licenses where necessary. Communication with suppliers to provide assistance in amending log-out times and access denied messages has also taken place.

Searching options

The SIRIUS interface provides a variety of different searching options for identifying relevant resources. Apart from subject category and resource type drop-down menus, browse and three keyword search (title, subject and all keyword) boxes are provided. The Sirius Group debated about the inclusion of all these options and in particular which were most useful to users. Opinion was divided - cases could be made for the value of each option depending on the

- type of resource
- type of user
- purpose for locating resources
- familiarity
- accuracy of search result.

In the end we went live with all the resource location options provided. Subsequent experience has indicated that there are definite user preferences for various options and we plan to review this area for the next academic year.

Complexity of interface

The Sirius search interface combines what in the past were a number of different steps, often involving a number of different interfaces and browser windows, into a single step. The Sirius [Metalib v.2.13] design is very good in the way that it combines these multiple functions within a single screen but there is obviously an accompanying increase in interface complexity. The situation is not improved when you also add in the necessity for navigation and access links to the personalisation functions of the system. There is a limit to how much "good design" can overcome this problem. This means that by its very nature the interfaces of these types of systems are going to always present a challenge to some users.

User response

Search interface

The version we implemented was generally agreed to be an improvement on the earlier version. However, this improvement did not necessarily translate into a perceived improvement for our users. The Sirius portal does provide a more functional system for locating, searching and managing resources and references, but this comes at a cost and the advantages of the system are

best realised in the long term once the user has added resources to their personal account, retrieved earlier searches and used their collection of saved records. However, as with most transactions, the initial contact is the most important in forming an opinion about the value of that transaction. The increased complexity of the search screen did not encourage a positive response from first time users.

Response to change

Before the Library introduced Sirius it provided access to its subscription electronic databases and journals via simple searchable databases. A search engine allowing *keyword only - all fields* searches was provided along with a-z links. There was no categorisation by type. LC Subject categories were downloaded with the list and not very effective in locating items by subject.

The Library did not have the resources to develop the system much further and certainly were not in a position to provide the range of additional functions provided by the Ex-Libris products.

With the introduction of Sirius the old databases were not continued, partly because staff resources were not available to maintain a separate system, but also because it was felt that users would not make the effort to learn the new system if the previous version was still available. Library users were informed of the changes via user mailing lists and liaison groups. Despite these efforts, the new system obviously came as a shock to many users. Although the same search functions were available in the new system (search and browse) we received many requests for the old system to be returned. The majority of complaints came from academic staff and postgraduate students, users that had been using the old system for many years. User observation in the Library revealed that new students were more likely to sit down and learn the system. Older users were less tolerant of changes despite the presence of additional functions designed specifically for their research needs such as saved searches, alerts and personalised resource lists.

With the benefit of hindsight the authors feel that the introduction of the Sirius system could have benefited from a longer lead-in time, allowing us greater opportunity to alert users to the changes in the service. A short period running the old and new systems side-by-side may also have eased the shock of the switch over.

New functions

The new system - apart from changes in design and appearance - is radically different from other resource discovery tools that we had provided for users. In the past we had merely provided users with lists of resources. Users did not necessarily expect us to provide additional functions of personalised accounts, automatic email alerts, simultaneous multiple database searches and bibliographic management tools. Although researchers in the area of information studies had detected user requirements for this type of enhanced functionality, our users themselves had not generally formed an opinion about what they needed or indeed about what the Library might provide in this area. The UNSW implementation was therefore not initially perceived by UNSW users as answering their needs. Acceptance of the system would have been increased by greater involvement of the general academic community in the system selection/implementation process and generally a more rigorous and ongoing level of engagement between the Library and the academic community.

Access login

Like many personalised systems the SIRIUS system requires a login to get the best from its features and allow access to resources. Although this is fairly common on the web and becoming more prevalent it was another aspect that our users had not had to encounter before in our library site. For security reasons logins would also time out, meaning that users may have to login several times in a day to access the system. User response to this feature of the system was generally negative. As with the increased sophistication of the search screen this feature did not promote initial acceptance of the value of the new system.

Summary

With the Sirius/SFX systems implementation, UNSW Library has achieved its strategic aim of introducing an integrated information access and management environment for its user community. However, managing change is never easy, and implementing systems that substantially differ from the more traditional, however beneficial to the user community, is going to make the job that much harder. The challenges are significant - not only for users, but for library staff and library management structures. As a general principle an open approach to different ways of managing and organising data and procedures is required. While this paper does not present any particular solutions to this perennial challenge, the authors feel that sharing the experience may be of some benefit to the profession.

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Appendix 1 – UNSW Library: IRAMS Conceptual Model

