



## Resource Discovery – Issues for the UWA Library

Prepared by Toby Burrows, Kate Croker, Ralph Kiel, and Scott Nicholls  
19 November 2007

### Introduction

In March 2007 the UWA Library's Online Services Team identified developments in resource discovery interfaces as a significant strategic issue within its brief.

Students and researchers are increasingly using a wide range of resource discovery tools to find and access resources relevant to their learning and research. These systems range from library tools such as the catalogue and federated search software like MetaLib, through university systems such as the course management system, to external tools such as Google and Amazon.

There are a number of recent studies and reports which indicate that researchers are "becoming more displaced from the library with respect to information finding, access and retrieval" (Research Information Network, 2007). According to one British study, over 70% of researchers routinely used Google to find scholarly content (Research Information Network, 2007). An OCLC report found that most searches by college students began with Google or a similar search engine (OCLC, 2005).

New resource discovery tools are proliferating on the Web, often as Open Source software. At the same time, commercial software vendors continue to develop new products, including new single search interfaces like Encore and Primo (Breeding, 2007).

This paper aims to assess the current situation, including the services currently offered by the UWA Library as well as significant global developments and trends. It presents recommendations for strategic and operational directions over the next two to three years.

### Resource Discovery Requirements

*Different users have different resource discovery requirements. What are the categories of users in Universities and what are their requirements?*

The resource discovery requirements of users within a university like UWA are affected by three main factors:

- What subject area are they learning or researching in?

This makes a significant difference once you get beyond the basic essay-writing level. The structure of the literature, the range of possible types of source materials, and the availability of electronic resources are all very different across the main disciplinary areas. Terminology varies from relatively precise to considerably fuzzy. The research process itself is significantly different. The contrast is greatest between the STM (science, technology, medicine) area and the HSS area.

- What type of user are they?

Undergraduates tend to be focused on doing simple searches for material to write short essays, or possibly more sophisticated searches for longer essays. Postgraduates and researchers are doing in-depth and extensive searches for an entire thesis topic, as well as various types of research investigations (updating knowledge of an existing area,

beginning work on a new area, writing a book, writing a grant application, writing up a research project, and so on).

- What level of knowledge and familiarity do they have with the Web, resource discovery tools, and IT in general?

Users can range from naïve through to moderately confident, confident, and expert. This does not necessarily correlate with their age group or level. Even though most new undergraduates tend to be very confident using the Web and IT, they are often ignorant of resource discovery tools. A particularly challenging group are some of the mature age students, particularly in the humanities, who may be largely unfamiliar with the Web and resource discovery tools and need considerable assistance to get over their lack of confidence with IT generally.

The combination of all these different factors results in a continuum of different requirements, ranging from the most simple (e.g. a naïve undergraduate in the STM area looking for basic introductory references for a short essay) through to the most complex (e.g. an advanced researcher in the humanities, with considerable Web familiarity, looking for all the relevant material on a loosely defined interdisciplinary subject). Some common threads across all these requirements are:

- To be able to reach an appropriate level of exhaustiveness. If users only want a quick and limited set of materials, they need to be able to specify this. If users want to be sure that they have found all relevant materials, they need to be able to do this.
- To be able to work at an appropriate level of confidence and familiarity with the Web and with the resource discovery interfaces.
- To be able to make allowances for the level of precision or fuzziness in their subject's terminology.
- To be able to cover an appropriate range of materials, e.g. just articles, or articles and books, or all types of relevant materials.
- To have simple and effective access to the resources discovered during this process.

Most generic resource discovery tools make assumptions about these requirements. These assumptions include:

- "Simple" and "Advanced" searches are enough to cover the needs of all users.
- Browsing is relatively unimportant; the emphasis is on searching.
- Keyword searching is the best way to address the issue of terminology.
- Articles (and to some extent books and theses) are what users are looking for.
- Linking to the resources themselves (electronic or physical) can be done by ISSN or ISBN.

These assumptions work best for the following users:

- Users in subject areas which have relatively precise terminology and where the literature focuses mainly on journal articles;
- Undergraduates and (to some extent) postgraduates;
- Users who are at least moderately confident and knowledgeable about IT and the Web.

The requirements of other types and categories of users are much less likely to be addressed effectively. In particular, generic resource discovery tools are of limited value to advanced researchers and postgraduates in subject areas which have relatively imprecise terminologies and a complex structure for their literature and related source materials. In practice this is likely to mean that the Library's resource discovery services are most effective for the science, medicine and technology, and least effective for the humanities and social sciences.

In its strategic and operational planning, the Library should recognize that a variety of resource discovery channels are required to meet the different needs of different users, as well as to meet the varying needs of a single user at different times.

## **UWA Library – Current Situation**

*What types of resource discovery do we offer at UWA? What is the purpose of each and who are they aimed at?*

UWA offers a number of resource discovery tools for Library users, mostly by means of links found on the first page of the Library web site.

From the first page of the Library web site under the heading *Find Information*, the Library provides links to the *Library Catalogue*, *SuperSearch*, *Find Journal Articles*, *Course Materials Online* and *Search the Web*. Through these five links, access is provided to seven major resource discovery tools.

1. The *Library Catalogue* provides access to all materials held by UWA Library, mostly monographs and serial titles via the OPAC. It supports searches for known items by title or author and for items on a particular topic through keyword search. Access is not authenticated and so all visitors to the website can search the Library Catalogue.
2. *SuperSearch* covers access to materials held within and beyond the Library's collection mostly electronic monograph and serial titles and articles. SuperSearch supports searches for known items and on a particular topic. You can search across multiple databases at once. Access is authenticated and so only those who have permission to get access, mostly University staff and students, can search SuperSearch.
3. *Course Materials Online* provides access to materials identified as important by lecturers to the various units. Items include online journal articles, book chapters, examination papers, or links to books and other items held in a Subject Library's Reserve or main collections. Access is authenticated and so only those who have permission to get access, mostly University staff and students, can search CMO.
4. *A-Z Journals* is found via the *Find Journal Articles* link on the first page of the Library web page. *A-Z Journals* is used to locate a specific electronic journal by title or a number of journals by subject. This discovery tool requires a user to authenticate before searching.
5. *Article Finder* is found via the *Find Journal Articles* link on the first page of the Library web page. *Article Finder* is used to check whether a specific online journal article that you have details for is available from the UWA Library. This discovery tool requires a user to authenticate before searching. Find Journal Articles also provides links to the *Library Catalogue*, *SuperSearch* and *Course Materials Online*.
6. The native interfaces of electronic databases subscribed to by the Library can also be linked to from records in the Library Catalogue, SuperSearch, A-Z Journals and Article Finder.
7. *Search the Web* directs users to search the seventh of the main discovery tools offered by UWA Library, web search engines.

Finally, on the first page of the Library web site there is also a link to *Catalogues at Other Libraries*, a list of links to other library catalogues.

UWA Library has a number of systems designed to support these discovery tools:

*Electronic Resource Management (ERM)* manages the Library's subscriptions and provides resource information to the OPAC. Fully integrated with the Millennium system, ERM enables libraries to keep track of their e-journal licensing and purchasing details using a single system and workflow.

*Find it* provides linking for electronic content. *Find it* is a tool for interconnecting library controlled resources and services and web resources not controlled by the Library. *Find it*

provides users with context-sensitive links to services that librarians define on the basis of their institution's e-collections and policies. Such services, which are dynamically created, can include links to the full text of an article, the OPAC (for local holdings), preferred document-delivery suppliers, related Web-based resources and services, local information repositories, and a range of other services.

UWA Library also has a number of other discovery tools:

*Digital theses*, provides online access to UWA theses. The University of Western Australia's Digital Theses Repository is a local archive of theses written by UWA postgraduate students. The theses have been converted into a digital format which means they are readable over the World Wide Web. UWA's Digital Theses Repository is part of the [Australian Digital Theses \(ADT\) Program](#), which aims to provide a national database of digitised theses.

**Please see APPENDIX 1 for more information on these resource discovery tools.**

## **Resource Discovery Usage/Issues**

*How well does our resource discovery meet the needs of our users? What types of usability testing are available and would suit our purpose?*

The Library's existing resource discovery tools can be divided into two main categories.

### **Single search tools**

These are tools which are designed to search across a defined content set and include electronic databases with native interfaces, Library catalogues, and to a lesser extent those types of tools used for known item searching such as the Library's A-Z list, Article finder, and Course Materials Online.

The advantages of these tools are:

- Results are often more focussed because the content set across which the user is searching is related to a specific subject area, collection, or format of material.
- They offer advanced search options which give the user more flexibility in their searching. These include extensive field searching, search histories, truncation, controlled vocabularies, and the ability to limit to peer reviewed items.
- Search results can often be manipulated through sorting or exporting.
- All of the above means that searching can be done in a more precise manner which eliminates a lot of irrelevant search results from the process.

However, these tools do have their disadvantages:

- For the novice user, it can be difficult to identify the right tool to use.
- Many of the advanced search options are not well understood and require instruction
- In order to be comprehensive in a search, users may need to search using multiple tools.
- They put content into containers and rely on users to come to it. This is at odds with perceived current user preferences which indicate that users want the convenience of resources integrating into their own online spaces (OCLC, 2003). Karen Coyle in her article "The Library catalog: some possible futures" puts it another way: "...library data should "leak out" into the information space" (Coyle, 2007, p. 414).

### **Multisearch tools**

Multisearch tools typically offer the ability to search and retrieve results from a multitude of sources using a single interface. They can work in one of two ways. Broadcast multisearch searches across databases simultaneously at the point of search and retrieves results into the interface. This type of searching relies on the ability of the tool to connect to target databases using protocols such as Z39.50. The Library's federated search engine SuperSearch is such a product. The other type of multisearching relies on local indexing. These tools operate by acquiring all of the metadata from the target databases prior to

searching and then storing it in their own indexes. When a user searches, the tool interrogates its own index rather than searching each database "on the fly". Google Scholar and Primo are examples of this type of multisearch tool.

The advantages of Multisearch tools (both broadcast and local indexing varieties) are:

- They're simple to use. A multisearch tool will often only require the user to fill in one search box to generate a search.
- They're familiar to users. For tools such as web search engines, many users already use these on a regular basis.
- They search multiple databases at once and as such allow the user to carry out a far more comprehensive search in one go.
- These tools integrate easily into user spaces as portlets or mashups.

They also have their disadvantages:

- There is a perception that they "dumb down" searching by only offering limited search options. Users cannot do things such as search using controlled vocabulary or limit searches to peer reviewed material.
- Searches often retrieve a lot of irrelevant material, especially where the search terms have common usage.
- Not all resources can be set up for multisearch broadcast searching. In some cases these are key resources in the subject area.
- Multisearch tools which use broadcast searching can also be slow in retrieving results, have time out issues with particular databases, and have poor relevance ranking.
- Multisearch tools which use local indexing require the cooperation of publishers and vendors to allow their content to be harvested, something which they are not necessarily interested in doing. As such, institutions looking to set up their own local indexes may have large resourcing overheads during start up.
- The process of institutions setting up local indexes is also at odds with the philosophy of integrating data into user spaces. Should libraries be developing their own discovery tools or integrating into others?
- Commercial versions of local indexes such as Google and other web search engines, while overcoming some of the challenges of negotiating access to content from vendors, still have the disadvantage from a Library's perspective in that they are not forthcoming with what is included in their index. As Jonathan Rochkind states in his article "(Meta)search Like Google", "There's no guarantee that all of your library's expensive licensed content, which you want to make sure users can find, is included in Google Scholar" (Rochkind, 2007, p. 29).

Underlying these various types of discovery tools is a tension between the one stop convenience, simplicity and comprehensiveness of the multisearch varieties against the searching power and precision of the single search tools. It is hardly surprising then that from recent user surveys and usage statistics it seems that information seekers in Universities are both familiar with and use a variety of discovery tools when searching for information.

In 2005 OCLC released the "College Students' Perceptions of Libraries and Information Resources" report which examined student preferences in regard to resource discovery (OCLC, 2005). In 2006 a similar study was carried out by California State University (Northridge) which surveyed student attitudes and experiences with their implementation of the federated search product MetaLib (Tenopir, 2007). Some of the key findings from these reports were that University students:

- Were heavy users of web search engines and usually started their searching with them.
- Reported high levels of awareness and usage of Library electronic resources, although not to the same extent as with search engines.

- When using Library electronic resources continued to use both native interface and federated searching methods for finding relevant articles and did not understand the limitations of either method.
- Found federated searching easier to use than native mode searching. However, many still felt they needed further instructional help on using federated searching.

**For fuller information on the surveys see Appendix 2.**

These findings are reflected in the usage patterns of the various discovery tools at the University of Western Australia Library. The Library catalogue, SuperSearch, and the various electronic databases promoted by the Library all receive significant use from the University community. Further to this, services which are not promoted as heavily such as the A-Z List, Article finder, and Google Scholar are also heavily used.

**For a more in-depth analysis of UWA usage statistics see Appendix 3**

Student users then are familiar with the various discovery tools available to them, even if they are unsure about the pros and cons of each. That is, students know there are more ways to find information than just via Google. This knowledge has most likely been born out of necessity given that no single discovery tool has yet shown it can service all reader needs all the time.

What is also clear is that if the holy grail of discovery tools which is a single search box which can search everything at once is to be achieved, that tool will need to solve some fairly major issues. Chiefly, the challenge for such a tool is how to turn what will inevitably be a huge result set into something that can be managed and be meaningful to the user. That is, it needs to deliver precision into multisearching. This is where new technologies such as facets, sophisticated relevance ranking, and tagging may have a part to play.

## Emerging Trends

*What new tools/technologies are emerging to make resource discovery better? Who are they aimed at and would they help solve some of the problems with our existing arrangements?*

### 1. Widening exposure of existing metadata

Institutions such as the British Library and OCLC are embarking on initiatives to expose their catalogue metadata through various other discovery tools (Brazier, 2007). The intent is to achieve maximum visibility for their catalogue's rich metadata to all potential users. This trend could be seen as a reaction to recent claims that the catalogue could become an irrelevant information retrieval tool for users as services like Google and Yahoo grow in use and dominance as users' preferred resource discovery tools.

UWA holdings will be included in OCLC's WorldCat as a result of the recent agreement between OCLC and the National Library of Australia. WorldCat data are already exposed to search engines like Google. OCLC also offers [deep linking](#) between WorldCat and the local catalogue. The National Library is working on [re-engineering Libraries Australia](#) in similar ways. [Google Book Search](#) already links to holdings in Libraries Australia. Google Scholar already links to the UWA Library catalogue.

#### Issues:

- Should the UWA Library take advantage of this trend? If so, in what ways?
- Should the Library be working with WorldCat to offer deep linking to the UWA catalogue?
- Should the Library be working with LibrariesAustralia and Google Book Search?
- What other global service providers should be investigated (e.g. Amazon, Yahoo)?

### 2. Enhancing existing metadata using Web 2.0 functionality

Several libraries and museums are employing Web 2.0 functionality to enhance their catalogue's metadata. This functionality allows users to supplement existing metadata with their own contributions. The idea is that communities of users can use their knowledge to add resource discovery value to the collections they know and use regularly. Examples include:

**Tagging** (allowing users to add keywords to records)

Aside from public libraries where fiction collections might benefit from such a service, recently the idea of more controlled tagging for specific academic purposes is beginning to emerge. For example, the British Library has asked scholars to tag and add commentary to their medieval manuscript collection.

**Folksonomies** – These are defined as "... the result of personal free tagging of information and objects (anything with a URL) for one's own retrieval. The tagging is done in a social environment (usually shared and open to others). Folksonomy is created from the act of tagging by the person consuming the information" (<http://vanderwal.net/folksonomy.html>). A well known example of this is [LibraryThing](#).

**Rating and reviewing** – pioneered by Amazon and now widely used, this allows users to contribute their own ratings and reviews of items in a catalogue or database.

There is some debate over the usefulness of these approaches, particularly the unstructured, inconsistent approach associated with "free tagging and folksonomies". However, such contributions are not necessarily expected to replace the standard metadata provided by catalogues. Instead, free tagging and folksonomies might enhance existing metadata, allowing involvement from the community using the information to provide an alternative access point to this information.

#### **Issues:**

- How would this work in the UWA environment – do we have special/discrete collections that could potentially benefit from this application?
- How much user demand would there be for this kind of feature?
- How would the Library moderate the tagging and folksonomies? (Or would it be moderated at all?) Would we require authentication?
- How do we maintain the quality and authority of the base record?
- Is this best done on the Library site, or is it more effective to encourage the use of existing services on the Web for these purposes (e.g. Connotea, del.icio.us)?

### **3. Reworking search results (searching, browsing, recommending)**

Searching large digital and physical collections has created difficulties for users trying to navigate large result sets. As a result, new technologies include a variety of options to help the user find exactly what they need. Examples include:

**Faceted searching** – provides browsing of search results by classification into groups. These groups can be based on location, availability, ranking as well as the more traditional subject headings. As a result, facet searching allows browsing beyond the traditional linear approach. OCLC WorldCat already offers this kind of functionality.

**FRBR (Functional Requirements for Bibliographic Records)** - "FRBR uses an entity-relationship model of metadata for information objects, instead of the single flat record concept underlying current cataloging standards. The FRBR model includes four levels of representation: work, expression, manifestation, and item"

<http://www.oclc.org/research/projects/frbr/> ). This represents a reworking of the traditional way metadata is presented and provides more flexibility for users to discover resources. Used by the [AustLit database](#), but still at an experimental stage in library catalogues – though the National Library is experimenting with re-engineering [LibrariesAustralia](#) on this basis, as is OCLC with WorldCat.

**Guided Navigation** – a name given to the system used by the Endeca product. Endeca presents the user's search results in a constant frame of context. As the user clicks through

to the results, “the context is created dynamically exposing the dimensions, attributes and other relationships underlying the data set.” (<http://endeca.com/>). This allows for discovery through browsing and exploration rather than continual searching and refinement.

**Semantic browsing and searching** – being developed in the museum and gallery sector as a sophisticated and powerful way of browsing catalogues and databases, and of implementing recommender services (e.g., [MuseumFinland](#)). This approach uses ontologies (rather than subject headings or thesauri) as the framework for structuring subject access and navigation by concepts.

**Issues:**

Given the current underdeveloped browsing options in both the catalogue and SuperSearch, these initiatives should be investigated further for potential use at UWA.

- Which datasets should these approaches be applied to? How do they relate to the specialized software of individual database platforms?
- Is it more effective to offer these approaches locally, or by using national or international resource discovery services like WorldCat?

**4. Pushing resource discovery into users’ digital work areas**

Rather than expecting or forcing users to come to the Library Web site and catalogue, libraries are investigating how to push resource discovery services out to users’ digital work areas. Users can discover and use resources within their individual working context and ultimately be linked through to the Library and its resources. Examples of this are:

**Leveraging** a discovery environment by inserting a SuperSearch or catalogue link into external portals or sites.

**Mash ups** – where third parties using API technology can integrate content into Web pages or portals or other information platforms.

**Syndication** – using technologies such as RSS feeds and OpenSearch to push resource discovery into the user’s environment.

**Issues:**

- Which user environments should the Library be targeting? The planned UWA portal is an obvious area, but what about specific UWA communities of researchers and student groups such as Student Services’ NODE and the Graduate Research School’s [My Research Space](#)?
- Should the Library be developing, adapting and providing toolbar extensions for Web browsers (e.g. LibX for Firefox)? Which browser software should be supported?
- What other possibilities are there for UWA to offer APIs and OpenSearch to external providers?
- Should services like the New Books List be offered as a blog and RSS feed?

**5. Integration of resource discovery**

Given the fragmented nature of most library collections there is a major focus on using resource discovery solutions to achieve a more fully integrated search facility for the user. This can include integration between various digital collections and/or integration between digital and physical content.

**Single Entry Points**

There are increasing examples of libraries providing the user with a “Google like” single search box to search the catalogue (see [National Library of Australia](#) and [University of Queensland](#) for examples).

Libraries are also starting to look at single entry points beyond the catalogue. These allow users to search across different sets of collections and search facilities (catalogues, federated search platforms such as SuperSearch, institutional repositories) using one generic search interface. As a result several “new generation” commercial resource discovery products have come on to the market to facilitate this. Such products include: PRIMO (Ex Libris), Encore



(Innovative), Aquabrowser (TLC is the distributor), OCLC WorldCat Local. Non library products include Endeca, Siderean and FAST.

Although all facilitate integrated searching, there are differences in the system architecture particularly as it relates to the way the searches are conducted. For example the ExLibris product PRIMO uses pipes to harvest metadata from the original records as the basis for its search results. III's product ENCORE uses a federated or broadcasting search approach. These differences will affect the quality and accuracy of searching.

Most of these products also incorporate some of the other trends and technologies already mentioned, such as tagging, faceted search results, and rating by users.

#### **Issues:**

- Is a single integrated search the most effective method of resource discovery?
- Is a local implementation the best way of providing this? Or are there Web services which might provide an effective alternative?
- Do we want our users to lose the context of their searching?
- Will these products address the requirements of sophisticated researchers?

## **6. Strategic issues**

### **6.1 Local level versus "system" level**

There is a growing view that libraries should be working at the "system" level to improve resource discovery for their users – i.e., through service providers like OCLC, LibrariesAustralia, Google and so on. The traditional solutions at the local level – more sophisticated locally-installed software – assume that users will come to the Library's Web site. They do not take full advantage of pushing metadata and resource discovery into the Web environments where users actually work (and play). The strategic issue for libraries like UWA is: how much improvement to resource discovery should be done locally, and how much should be done at the global, external level?

The latter approach makes the Library more vulnerable to external changes and pressures, but it recognizes the reality of how users prefer to find material of interest to them.

### **6.2 Open Source versus commercial software**

Much of the emerging technology and trends focuses around Open Source software – or at least APIs and Web services which are made freely available for developers to use in integrating resource discovery processes. There is an important strategic issue here: whether to wait for commercial products to incorporate new tools and technologies or to participate in the process of developing or implementing Open Source solutions. The latter is likely to provide more flexibility and more responsiveness, but might be less robust and reliable. The former approach might be more robust, but is usually slower to appear and offered as a take-it-or-leave-it package which may not be fully compatible with the Library's needs.

Until now, the UWA Library has largely relied on commercial solutions for resource discovery. A different mix of I.T. skills and expertise might be required if the Library decides to include more Open Source approaches in its resource discovery environment.

## **Conclusions**

Current trends and developments seem to revolve around reworking the metadata in the catalogue by:

1. Exposing it more widely and therefore increasing the likely discovery of it by users.
2. Pushing it out beyond traditional library discovery environments and integrating metadata within the user's own work space.
3. Simplifying the discovery by providing a single search entry point rather than different ones for different collections.
4. Enhancing the existing metadata through user based descriptions and organisation of items rather more traditional controlled "library language".

5. Pulling out different elements of metadata to create more meaningful, relevant and attractive result sets that allow the user to discover further items by browsing rather than further searching.

## Reading List

- Brazier, C. (2007). Resource Discovery at the British Library: new strategic directions, 113 *National Library with ICABS and Information Technology, World Library and Information Congress*: . Durban, South Africa. Retrieved 27 July 2007.
- Breeding, M. (2007). Next-generation library catalogs. *Library Technology Reports*, 43(4), 1-43.
- Coyle, K. (2007). The Library catalog: some possible futures. *Journal of Academic Librarianship*, 33(3), 414-416.
- OCLC. (2003). *Environmental Scan: Pattern Recognition*
- OCLC. (2005). *College Students' Perceptions of Libraries and Information Resources*.
- Research Information Network. (2007). *Researchers' Use of Academic Libraries and their Services: A report commissioned by the Research Information Network and the Consortium of Research Libraries*: Research Information Network.
- Rochkind, J. (2007). (Meta) search like Google. *Library Journal*, 132(3), 28+.
- Tenopir, C. (2007). Can Johnny search? *Library Journal*, 132(2).
- Wrubel, L. a. K. S. (2007). Usability testing of a metasearch interface: a case study. *College & Research Libraries*, 68(4), 292-311.

## Appendix 1: Current UWA Library Resource Discovery Tools

### 1. WebOPAC

WebOPAC covers all materials held by UWA mostly monographic and serial titles. It supports searching for known items and on a particular topic.

#### Essentially:

- Millennium OPAC can be remotely browsed from any place at any time
- Offers search capabilities by author, title, subject, author/title, keyword, browse, and many other functions
- Patron options include placing and cancelling holds, self-view of patron records, self-renewal, modifying personal information

#### Extra functionality:

##### Advanced Searching

Key features include:

- Keyword searches by field (global or specified), in combinations (from different fields, by any letter, indexed symbol or number (from a single character to unlimited word lengths, including characters such as "#" and "\*") and the ability to pre-limit searches
- Adjacency searches within any indexed or specified field, from any point in a field, in combination with multiple phrase searches (from any/all fields)
- Proximity searches with default proximity (within ten words), user-defined proximity and locatable in specified or reverse order
- Relevance ranking. We use right result relevance ranking which is based on phrase position in bib record.

**My Millennium** allows individual patrons to customise their records forming the basis of their profile. My Millennium automatically saves both staff and patrons extra keying and time during lengthy search sessions by enabling patrons to conduct a search, save it, and come back to it later. Upon logging in through their patron record, users can:

- choose the format by which their circulation notices are sent to them (email, telephone, postal mail)
- customize personal data on their patron record (such as address, telephone number, email address)
- sort checked-out items by a number of parameters
- suggest titles for library acquisition, and be automatically notified by email when the book arrives

**Scoping:** Millennium users can search collections by **scoping**. By choosing the search parameters that work best for them, staff and patrons can find materials quickly, easily, and seamlessly, enabling them to confine their searches, at the outset, to a subset of the database (*e.g.*, the location from which they are searching, a particular material type, or locations and material types in combination).

##### WebPac Pro

One function of WebPac Pro has been implemented by the Library – Increase results in browse display which has been increased from 12 to 50.

Most of the functionality of this product is due for implementation in the second half of 2007:

**Customising:** The bibliographic, resource, and course record displays are customizable forms allowing library control over the position of elements of the page and the inclusion of additional text or other presentation.

**RSS feeds:** Really Simple Syndication (RSS) allows libraries to guide users to timely information: to alert patrons to new library information, information they've acquired or to

trusted sources on the web. Millennium allows RSS feeds to be brought from news sites into pages on the Millennium catalogue. A Library can also publish catalogue data from Millennium into patron feed readers with Feed Builder.

**Relevance Ranking:** RightResult search technology can be integrated into the online catalogue as part of their WebPAC Pro implementation. RightResult searches return a grouped result set based on an advanced relevance-ranking algorithm developed by Innovative. The outcome is that patrons are most likely to find what they need more quickly and at the top of the results display. The results are grouped together in sets of similar relevance. It's easier for them to choose between the 'most relevant' and 'relevant' groups than hunt further down for what they need. It provides a similar service to those found on the Web such as search engines.

The aim of relevancy ranking is to help bring the best results to the very top and to subdivide the remaining results based on relevance. Search results appear in up to 5 groups depending on search results.

- Group 1 contains the most relevant results; the very small number of titles where the primary title contains the search as a phrase (for example, *Good To Great*).
- Group 2 contains the next most relevant results, the "Best Bets". The items in it are weighted more heavily because of where and how the terms appear in the record (for example, *Paralegal success: going from good to great in the new century*).
- Group 3 contains results that would have been found doing an adjacency search, but those deemed less relevant than the first group (for example, *Coaching, mentoring, and managing* that has the phrase "good to great" in the summary).
- Group 4 includes some AND results, but still contains items weighted more heavily because of where and how the terms appear in the record (for example, *Ageless: what every woman needs to know to look good and feel great*).
- Group 5 contains the remaining results matching the search (for example, *100% pure Florida fiction: an anthology* that has "great" in the contents and "good" and "to" in the summary).
- All groups display in order defined by your default Keyword sort order (Title or Date).
- If no results are found in these groups, the system falls back to an OR search as in the current Keyword options.

## 2. SuperSearch

*SuperSearch* covers materials held within and beyond the Library's collection, mostly monograph and serial titles and articles. It supports searching for known items and on a particular topic. The patron can search across multiple databases at once. *SuperSearch* streamlines the discovery process by presenting users with content from multiple information providers in one user interface and eliminates the need to learn different search methods and interfaces.

It also allows clients to browse or search for a resource and then link to the native interface.

Merged result lists are:

- De-duplicated
- Ranked by relevance
- Grouped into topic clusters
- Grouped by facets - author, date, journal, or other attributes

The *SuperSearch* interface accommodates varying levels of expertise:

- Simple, keyword search
- Advanced, fielded search with Boolean operators
- QuickSearch workflow for novice users

- MetaSearch workflow for expert users

Additional research support tools let users reflect their individual preferences in the *SuperSearch* interface:

- Personalized resource lists, organized into searchable sets
- Saved search result records, searches and alerts
- Personalized e-journal lists

### **3. Electronic databases**

Electronic databases cover materials within and beyond UWA collection including monograph and serial titles and articles. It supports searching for known items and on a particular topic

### **4. A to Z List**

The A-Z list covers serial titles held by UWA. It supports searching for known items.

### **5. Article Finder**

Article Finder covers articles held by UWA Library. Supports searching for a specific online journal article where details are known is available from the UWA Library.

### **6. Course Materials Online (CMO)**

CMO covers articles, monographic titles, and book chapters held by UWA. It Supports searching for known items and browsing by unit. The Resource List Management System (RLMS) is the software which forms the foundation of the Library's 'Course materials online' service.

The RLMS enables students to browse or search for their unit's single, consolidated list of course material, whether the items are electronic or located in the Library's physical collection; sort the list into different orders; jump from the list to electronic copies of the object; and access their list of course material from WebCT, without having to log in again.

Teaching staff are able to submit digital material into the repository themselves, or request the Library do so on their behalf; manage their unit reading lists, set when items should appear and disappear from the list; determine the order in which citations should appear; group citations into unit-relevant categories; and add a note to each citation to direct the student in the item's use or worth.

A Flash demonstration can be found at:

[http://www.library.uwa.edu.au/library\\_services/course\\_materials/editing\\_your\\_list\\_in\\_cmo\\_a\\_demonstration](http://www.library.uwa.edu.au/library_services/course_materials/editing_your_list_in_cmo_a_demonstration)

### **7. Web Search Engines**

A web search engine is a program designed to help find information stored on the World Wide Web. The search engine allows one to ask for content meeting specific criteria (typically those containing a given word or phrase) and retrieving a list of references that match those criteria. Search engines use regularly updated indexes to operate quickly and efficiently. [en.wikipedia.org/wiki/Web\\_Search\\_Engines](http://en.wikipedia.org/wiki/Web_Search_Engines)

We also have a number of systems designed to support these discovery tools:

### **8. Electronic Resource Management (ERM)**

Fully integrated with the Millennium system, ERM (Electronic Resource Management) enables libraries to keep track of their e-journal licensing and purchasing details using a single system and workflow.

ERM enables libraries to:

- Manage licensing and purchasing details in a single interface
- Provide additional fields for storage of relevant data for staff, this may include: URL, username/password, IP addresses, contact information, etc.
- For patrons, this may include: printing permissions, interlibrary loan availability, etc.
- Display information about electronic resources in the Web OPAC for public services staff and patrons
- Define relationships between aggregators or publishers and the resources they provide
- Manage payments and other financial and subscription details

## 9. Find it

*Find it* uses the SFX software and is a tool for interconnecting library controlled resources and services and web resources not controlled by the Library e.g. Google. *Find it* provides users with context-sensitive links to services that librarians define on the basis of their institution's e-collections and policies. Such services, which are dynamically created, can include links to the full text of an article, the OPAC (for local holdings), preferred document-delivery suppliers, related Web-based resources and services, local information repositories, and a range of other services.

For library patrons, *Find it* means access to the resources they need.

- The SFX knowledge base is constantly updated so users always have access to the most current resources.
- A range of delivery options: full-text, print holdings, e-books, and others offer users multiple ways to obtain the information they need.
- Multiple customizable access points - A-Z List and Citation Linker - streamline the information discovery process.

For librarians, *Find it* provides a set of tools to easily localise and customise access to resources, keep them up-to-date, and track the usage of these resources.

- Extensive customization options allow libraries to provide a solution that best fits user requirements.
- A comprehensive reporting package provides real-time visibility into usage patterns and trends.

## 10. Digital theses –providing online access to UWA theses

The University of Western Australia's Digital Theses Repository is a local archive of theses written by UWA postgraduate students. The theses have been converted into a digital format which means they are readable over the World Wide Web.

UWA's Digital Theses Repository is part of the [Australian Digital Theses](#) (ADT) Program, which aims to provide a national database of digitised theses.

Digitised theses which reside in the UWA Digital Theses Repository can be located by searching the Library catalogue, just like other theses produced at UWA. A digitised thesis will contain a hyperlink to the version in the Repository

## Appendix 2: User Surveys

California State University (Northridge) in 2006 conducted a user survey of their students to consider attitudes and experiences with their implementation of the federated search product MetaLib. They received 88 respondents in their survey and made the following key findings (Tenopir, 2007):

- Students found federated searching easier to use than native mode searching. However, over half still felt they needed further instructional help on using federated searching.
- Most respondents continued to use both native interface and federated searching methods for finding relevant articles and did not understand the limitations of either method.
- Academic staff might have one or two favourite electronic databases which generally overrode their willingness to try different search tools like multisearch.

A similar usability study of MetaLib for the University System of Maryland found that students “perceived metasearch to be a useful tool”. But various aspects of the functionality and interface design “contributed to low rates of success in completing tasks” set as part of the testing process (Wrubel, 2007)

In 2005 OCLC released the “College Students’ Perceptions of Libraries and Information Resources” report (OCLC, 2005). The survey gave some key findings on student preferences in regard to resource discovery. To begin with, it was clear that search engines were a key discovery tool, especially Google. The survey found that:

- 89% of college information searches begin with a search engine
- 68% reported Google was the search engine used most recently
- 72% indicated that they were extremely familiar, very familiar, or somewhat familiar with search engines
- Just over 80% indicated they had used a search engine at least once.

However, the survey also found that college students reported high levels of awareness and usage of Library electronic resources, although not to the same extent as with search engines. As such, students may be starting their information search with a search engine, but at some point they are also relying on discovery using Library catalogues and online databases. The survey found that:

- 58% of college students were extremely familiar, very familiar, or somewhat familiar with online databases
- 42% indicated using online databases at least monthly
- 47% reported using the Library catalogue at least monthly
- 56% use the library web site at least monthly

These results were replicated in the UWA Library’s 2005 LibQUAL survey. In that survey it was found that:

- Undergraduates were regular users of the Library web site (82% visit at least weekly)
- Undergraduates were regular users of non-library gateways (eg Google) (89% indicated daily or weekly use)

Similar results were also found for postgraduates and academic staff.



## Appendix 3: Analysis of Usage Statistics

### FindIt source statistics

The FindIt source statistics measure the number of times readers click on Find-it buttons from within the various resources which have been activated as FindIt sources. That is, it is measuring where users are finding useful references and are pursuing full text. If a source already has full text material, readers are less likely to need Find-It links and therefore these types of databases tend to have lower statistics. However, as a general indicator for measuring the use of abstracting and indexing tools it can be quite useful.

FindIt source statistics (Jan 2007 – July 2007)

Source	Requests
SuperSearch (Cumulative total for all SuperSearch sources)	148,069
Native Interfaces (Cumulative total for all native interfaces)	105,628
A-Z Journals list	51,347
Ovid: Medline	38,729
Library catalogue	23,823
Article Finder	20,243
Google Scholar	14,379
Ovid:PscylInfo	11,100
Web of Knowledge	10,268

Some key points to note from these statistics:

- SuperSearch is the largest source for FindIt links and as such indicates a healthy use of this resource by the UWA community.
- There is still a large level of native interface use given that three of the top 8 FindIt sources are coming from those types of databases (Medline, PsycInfo, and Web of Knowledge). Also, by cumulating all of the FindIt source statistics generated from native interfaces it can be seen that they are the second largest FindIt source behind SuperSearch.
- Google Scholar was only activated as a source in mid March 2007 and has not been actively promoted until recently. However, it has climbed quickly into the top 6 of sources generating FindIt activity.
- The Library catalogue generates FindIt usage through readers clicking on the links to full text journals. As with Google Scholar, these FindIt links in the catalogue have only been activated in the last 3 months as part of the ERM-SFX synchronisation project. In that short time it has quickly jumped into the top 4 as a FindIt source. As such, it would appear that both the A-Z list and the Library catalogue are both key tools for readers when accessing known journals.
- A majority of the Library's discovery tools as outlined in Section 2 of this paper "Current Situation" are listed in the top 10 as FindIt Sources. The only one not listed is CMO and this is because it is not a FindIt source.

### Vendor statistics

Looking at vendor usage statistics can provide another indicator of which discovery tools readers are using. However, given that each vendor measures their statistics slightly differently, we need to be cautious about using these figures in a comparative sense.

SuperSearch statistics (2006)

Function	Number
Logins	473,172
Number of searches using Quicksets [Multisearch tool]	202,973
Number of links to Native Interface [Single search tools]	236,847

#### Library catalogue statistics (2006)

Function	Number
Number of searches (excluding staff searches on barcode and record numbers)	3,656,596

Some key points to note:

- Both the Library catalogue and SuperSearch are heavily used discovery tools. On average in 2006, each day there were approximately 1,300 logins to SuperSearch and 10,000 searches carried out on the catalogue.
- SuperSearch is utilised equally as both a multisearch tool (Quickset searching) and as an access point for single native interface searching.

Overall at UWA then, there is no one discovery tool which users are using over all others. Instead readers are using the variety of tools available via the Library website including SuperSearch, the Library catalogue, the A-Z list, electronic databases, Article Finder, and web search engines.