

Utilising tools for discovery

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Abstract:

AUT University Library is a member of LCoNZ, the Library Consortia of New Zealand, which collaborated to install the Voyager system. Part of this collaborative activity included the installation of a federated searching service. The paper explores what happens when a library introduces a discovery tool, and then has to withdraw the service. The full text downloads statistics show the outcome of searches made using the EnCompass commercial federated searching service, Google Scholar, and then return to a commercial federated searching service, 360 Search. The paper will detail further changes planned to ensure a successful transition into the Web 2.0 environment.

Introduction

In January 2007, there was an air of expectancy within the AUT University Library (the Library) as the 2006 annual report was being written and the statistics were being collated. In 2005 the full text downloads from e-resources had risen by 30% on the number of downloads in 2004. There was, therefore, an expectation that the 2006 full text download figure would show an increase.

The Library had moved quickly and successfully into the Digital Age. As the Library had a small print serial collection, this enabled it to adapt to the electronic journal collections more quickly and easily than some other libraries. This led to the acceptance of a hybrid library model very early on, and as has been stated before (Jenks, et al, 2005, p. 66) the "AUT Library remains committed to a hybrid library model by growing the print collection and will embrace new and innovative technological ideas, which facilitate access to a diverse range of e-resources."

The ability of students to work in a hybrid environment is borne out in a recent article (Head, 2007, p.11), where it was noted that "students seek a balanced approach to course related research, leveraged both online and offline resources".

The rapid growth of electronic resources continues to take place with consequential changes to Library services that have helped to disseminate information to members of the AUT University community. Over the years the Library concentrated on building the e-journal aggregated collections, with the addition of specialised publishers' packages coming later in the process. To enhance the discovery of digital content and maximize the hybrid environment, the Library became an early adopter of a federated searching service.

The number of e-resources continued to grow from 2004 to 2006, and the Library's expectation was that the full text downloads total for 2006 would exceed the 2005 total. One explanation why this expectation was not met could be that the methods for gaining access to these resources had changed during 2006 from a federated search service to utilising links in Google Scholar. Another contributory factor to this decrease could be the acceptance of e-reserve by the staff and students of the university.

Statistics

In 2004, the Council of New Zealand University Libraries (CONZUL) agreed to collect e-metrics. The Library participates by collecting the CONZUL e-metrics, which are –

- number of session (logins) to electronic databases
- number of searches in electronic databases
- number of successful full-text article request

While it is difficult to obtain usage statistics from all of the database vendors, it is even more difficult ensuring that you are measuring the same thing. Although the Library is

aware that these collated statistics are an incomplete picture of database use, the statistics are nevertheless useful, as they are able to give the Library a ball park figure to work with, by establishing a crude measure of usage. Being able to use statistics to show trends and to justify library services has always been important in the print environment and it is equally important for libraries working in with the electronic environment. This is supported by Organ, (2006) who stated that “the onset of the Internet and an ever changing information technology landscape have provided new statistical sources to supplement the data available from traditional tools such as citation indexes and journal circulation figures.”

The CONZUL e-metrics show that the full-text download figures dipped considerably, falling by 23% from 2005 to 2006, against the trend of previous years. This statistical evidence, as shown in Figure 1, clearly confirms that there was an increasing e-metric trend for full-text article requests prior to 2006 and that this trend was re-established in 2007 with a 35% increase.

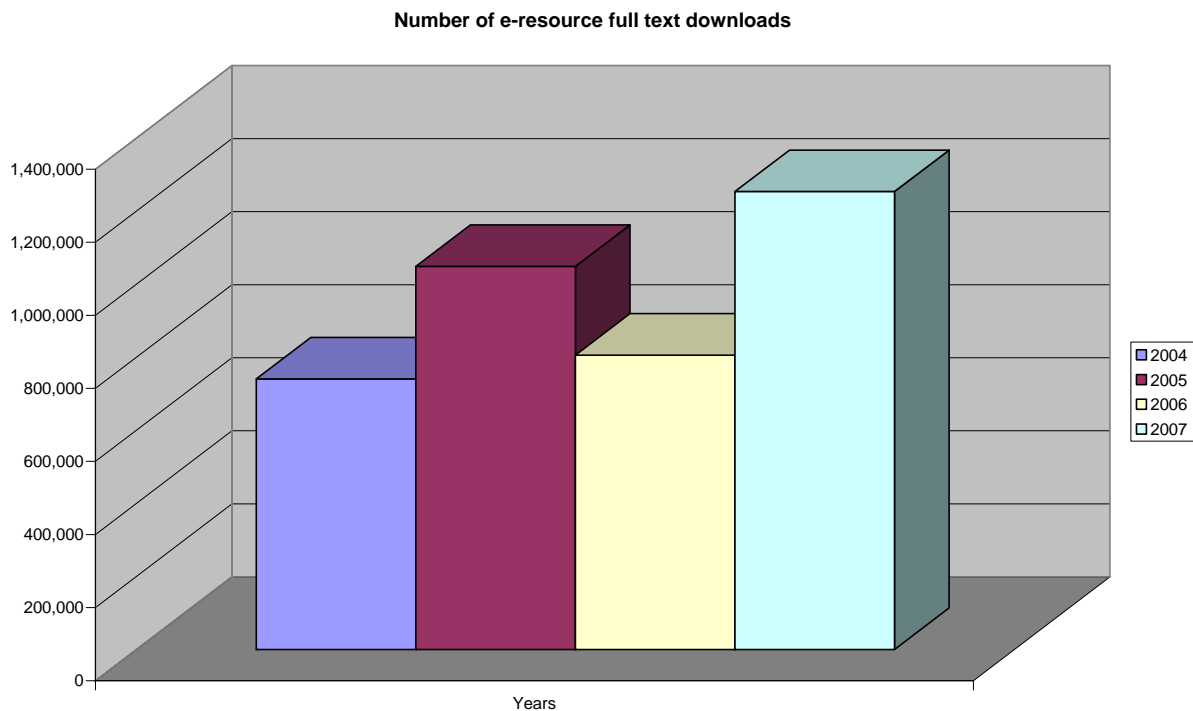


Figure 1. Chart showing full-text download statistics for e-resources 2004 - 2007

While the actual number of full text downloads decreased during 2006, the number of sessions and the number of searches steadily increased from 2004 to 2007 as can be seen in Figures 2 to 4.

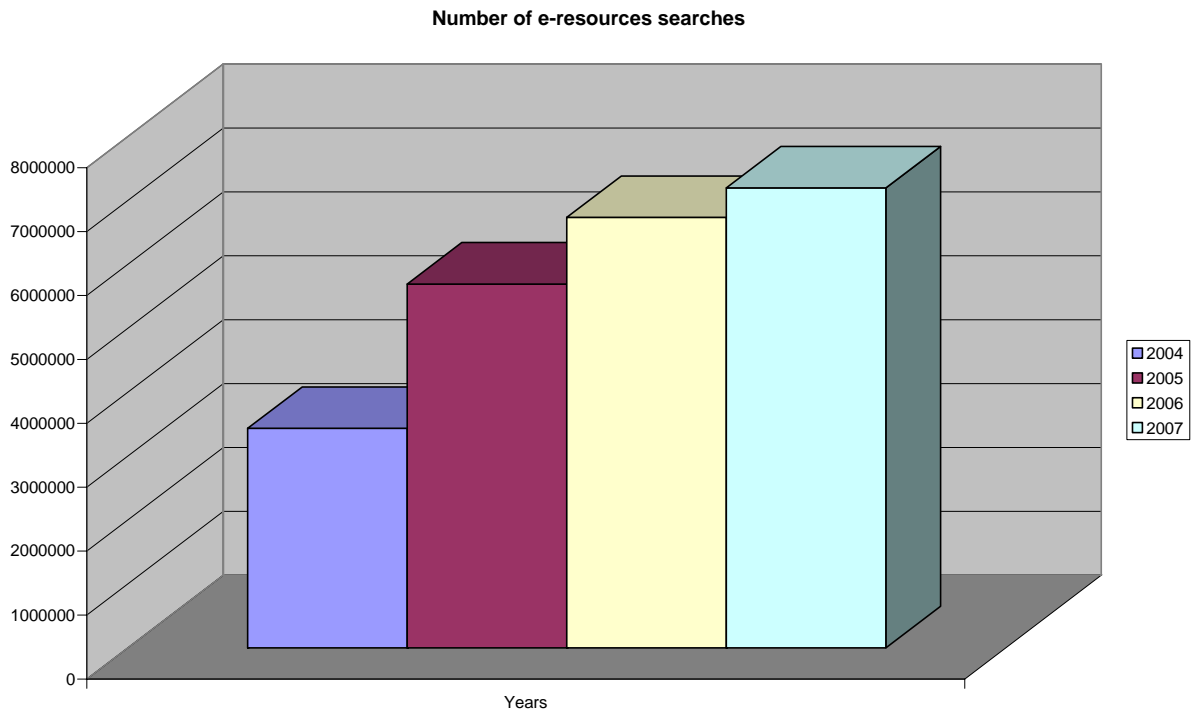


Figure 2. Number of e-resources searches 2004 – 2007.

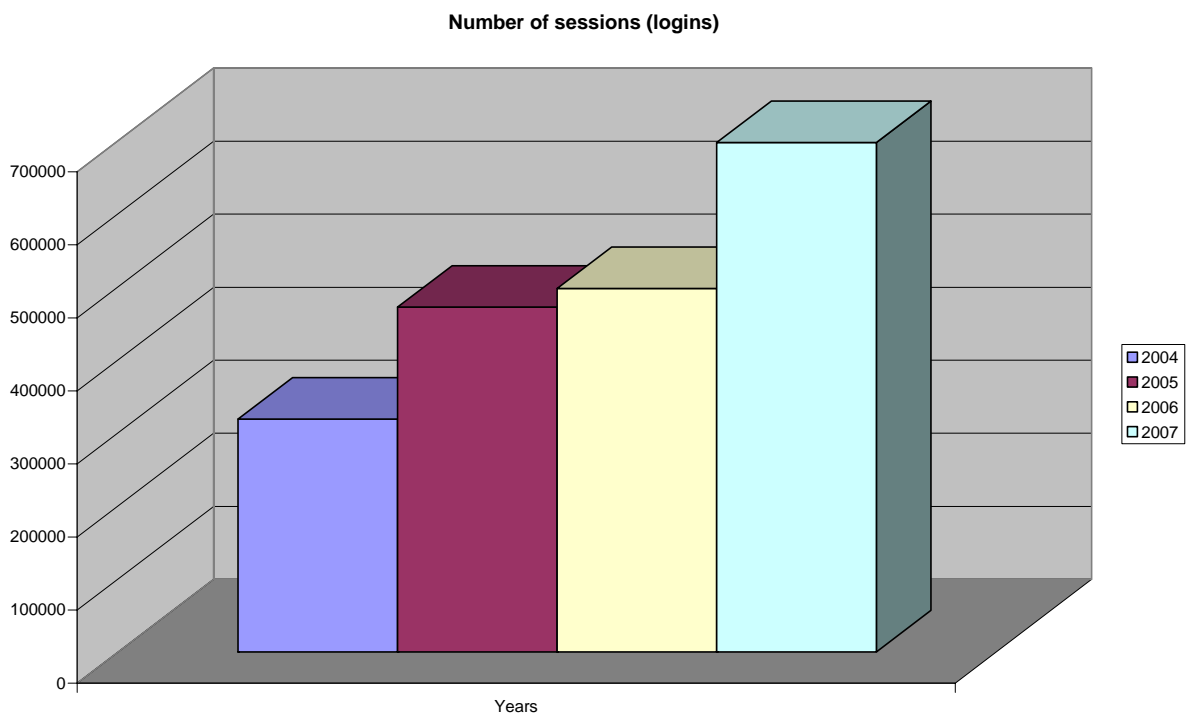


Figure 3. Number of sessions (logins) to e-resources 2004-2007.

Searches and session for electronic databases	2004	2005	2006	2007
No of sessions	318,843	472,125	497,645	697,553
No of searches	3,434,062	5,693,345	6,735,790	7,198,955

Figure 4. CONZUL e-metrics

During 2006, the Library faced a small budget cut, however the Library was still able to continue to purchase access to new e-resources as can be seen in Figure 5. The electronic serial figures are those collated from the Council of Australian University Libraries (CAUL) Deemed List, from which duplicate titles have been removed. New electronic titles were purchased as either individual electronic serials, new publisher's collections, additional titles added to aggregator's collections or as new e-book titles.

	2004	2005	2006
Electronic serials - individual titles	509	554	581
Electronic serials within a single Publisher's collection	7,564	8,306	8,957
Electronic serials within aggregated collections	28,780	33,732	37,713
e-books	2,573	23,155	26,455

Figure 5. Growth in e-resources from 2004 – 2006.

The statistical evidence is then used to verify that the AUT community is using the e-resources. From an AUT management point of view, the return on investment for an e-resource is able to be calculated by the number of full text downloads divided by the cost of the e-resources (see Figure 6.), which shows the overall picture by displaying the combined cost per annum of all e-resources divided by the total number of full text downloads. The rule of thumb is that, if each full text download from an individual dataset returns a cost of less than an inter-library loan (an inter-library loan currently costs NZ\$20.00), then the individual e-resource is considered to be providing a good return on investment.

	2004	2005	2006
Cost of e-resources	\$3,197,506	\$3,196,480	\$2,910,301
No. of f/t downloads	741,040	1,049,017	806,000
ROI	\$4.31	\$3.04	\$3.60

Figure 6. Return on investment (ROI) for full text database uses

Utilising federated searching to discover digital contents

Discovery of the contents of e-resources is made easier by the utilisation of tools. Examples include the Internet, e.g. Google, or a commercial federated searching service. In 2004, the AUT Library was the first New Zealand university library to utilise a federated search facility, EnCompass for Resource Access (EnCompass).

To understand the Library and how it operates, we need to go back to 2002. In 2002, four New Zealand universities (AUT University, University of Waikato, Victoria University of Wellington and University of Otago) took the initiative to work in a collaborative way to evaluate, select and implement a Library system. This project collaboration was named CONZULSys. Out of this project came the Library Consortium of New Zealand (LCoNZ) in 2004 which evolved from the CONZULSys project oriented consortia structure to the present day LCoNZ closely held private company. AUT was a founding member of LCoNZ.

As has been stated (Dewe, 2006, p 1), from “early on CONZULSys agreed that it was looking at something bigger than just a ‘library management system.’ The Steering Committee was indeed guided by the assumption that the main aim was not to simply replace existing library systems with a shared and improved version but to respond to the need for something that was fundamentally different. This expansion in focus was signalled in the shift from an integrated library management system (ILMS) to the much broader Information and Resource Access Management System (IRAMS).”

The Voyager ILMS system won the bid and this project initiative went live in June 2003. The IRAMS part of this collaborative activity was EnCompass for resource access, and the installation of this EnCompass software, which facilitated federated searching, took place in 2003.

There are two additional technological facets to a federated search service that need to happen consecutively to ensure that federated searching is productive. One is the Knowledge Base with its various components, which will be discussed later in the paper, and the second is the link resolver. The link resolver software needs to be installed and tested alongside the federated searching service. Link resolvers are what makes it all happen. Using a federated searching service, a user can discover an article

by a particular author on a particular subject. While this functionality is not new, the key is the ability of the link resolver to take the next step after the discovery of an item of interest and link the library user directly to the actual resource while online. The LCoNZ libraries worked together to install LinkFinderPlus to work in conjunction with EnCompass. A link resolver product can be installed as a stand alone product; it does not need to be part of a federated search service.

Very briefly a federated search service consists of the following three resources –

- A target which is defined as a searchable resource.
- The Knowledge Base which is comprised of targets.
- A connector, which is a piece of code that talks to the database.

The Knowledge Base and connectors are maintained by the federated search vendor. It is the robustness of these connectors that makes or breaks the product. When connectors consistently fail to connect, users and Library staff stop choosing that database as a place to search and then effectively downgrade the ability of the federated search service to locate the information that is being sought. A target is a dataset, which is a searchable resource. Each e-resource vendor decides whether or not they will allow their resource to be searched by a federated searching service. To be of maximum value to libraries and their users, targets need to be made reliably available and they need to include credible results that users will find useful.

During 2004, the four LCoNZ universities formed EnCompass Working Parties with a Project Manager within each of the universities. The Working Parties reported back to the CONZULSys Project Office on a weekly basis. Decisions were made about which targets to include and were specific to each library. The Liaison staff chose the subject categories and decided on targets for inclusion. It was decided early on in the project that the Library's online catalogue would become a target. A test server was set-up, with the federated searching service being fully installed within this environment.

EnCompass was renamed multisearch by the four universities working together on the project. By sharing the workload to test and understand this initiative, the libraries were able to move through the various set-up tasks at a faster pace.

The big day arrived and the LCoNZ system was tested with a live multisearch product. The servers could not cope with the traffic that was generated by all four sites and the testing procedure ground to a halt. The project teams reformed and cut, discarded and trimmed the targets while the technical boffins reconfigured the servers. A new test date was set. Once again, the big day arrived and live testing began. This time the servers coped with the traffic and we were able to limp through the set testing process. Response times were very slow. Despite these concerns, AUT decided to forge ahead and launched multisearch in April 2005.

Search functionality and speed are very important. While much of this is down to the response time from the individual vendor's targets, the federated searching service does need to ensure that the speed of their application and its ability to render returned

results falls within acceptable timeframes. For the Library and its users, timeouts became a huge issue, forcing users to resubmit their searches. This meant that users had to spend additional time retyping their search strategies and waiting for their results. Even with these irritations, the Library received anecdotal feedback from users who enjoyed the additional functionality of this discovery tool.

The Encompass software proved to have fatal flaws within the Knowledge Base, making the connection to databases and then linking through to the articles themselves tenuous at best. More and more Library staff time was being spent on selecting targets that would return results, this proved harder and harder and as time went on numerous targets were withdrawn as they were not robust enough. When these damaged targets were utilised, they would often cause the software to crash.

As a group, the Library staff learnt a lot about federated search services throughout 2004 and 2005. This proved useful when the decision was made to move forward on the second iteration of a federated searching service.

Recognising these difficulties, it is understandable that the Library did not realise its expectations of increased full-text download requests for 2006. Looking at the drop in the statistics that took place during 2006, we need to investigate further what was happening in the Library throughout 2006.

What was different about 2006?

During 2006, a number of variables came into play. Throughout 2005 and in early 2006, the Library continued to maximize the promotion and use of the multisearch resource. During 2005 and for the first semester of 2006, sessions on how to use multisearch were embedded into the information literacy programme. A feature of this programme at AUT has been Database Week. These sessions demonstrated how to search across multiple databases with specific queries using multisearch.

In addition, a brochure was produced stating that multisearch could be utilised for simultaneously searching through multiple resources, including the library catalogue, to gain access to relevant articles, books, videos etc. multisearch provides a scattergun effect when searching. When it was first introduced, the product was promoted to the AUT community as being the starting point for their initial information enquiries. Library staff referred to multisearch as a survey tool.

After a period of indecision, the vendor decided late in 2005 to withdraw support for the federated search product in 2006. The vendor ratified this decision in February 2006. Although the Library had invested a huge proportion of time into making the federated searching tool work, the Library was forced to discontinue using multisearch. It was decided at AUT that the replacement tool to be used in the interim while LCoNZ evaluated current federated searching services was to be Google Scholar.

Staff expressed concern about utilising Google Scholar as the only search tool, however Library Executive made the decision that it was better to offer some form of discovery tool, as members of the AUT community were used to executing federated searches. In a paper presented to Library Executive in July 2006, it was noted that Google Scholar had limitations (Murdoch, 2006), these included;

- “it is not specifically searching library subscribed resources,
- it is not able to search the library catalogue
- it is not possible to create subject or user specific collections of resources
- it is not possible to create additional interfaces or to customize the interface.”

Being mindful of these limitations, Google Scholar was looked upon as an option, and not the answer, for the Library.

Google Scholar

Google Scholar is a freely available Web application, which is a discovery tool. Unlike Google, Google Scholar has a harvesting model and a central database, and it is able to search across a variety of e-resources. Google Scholar uses structured metadata that enables the searcher to conduct a search by author, publisher, date and subject. However, only some publishers are allowing Google Scholar to access their products.

After the demise of multisearch, the Library offered Google Scholar as an alternative searching tool. AUT staff and students were directed to use Google Scholar from June 2006 until early August 2007. Library staff set up Google Scholar to recognise and retrieve AUT resources by activating the Open URL Resolver thus ensuring that Google Scholar was working as best it could. There are no statistics to prove how this service operated for AUT staff and students.

The Library's Digital Services Team invested time in activating links in Google Scholar to ensure access to AUT e-resources, making them discoverable in Google Scholar searches. With restrictions placed by publishers as to what datasets could be accessed, this gave only partial coverage to targets that had been previously available in multisearch.

When searching Google Scholar, Library staff were directing users to follow the links and gain access to the resources accessed by the Library. Library staff heard anecdotally that when users were left to their own devices, only those resources that appeared at the top of the hit list were opened; often the majority of these hits were for open URL resources not held by the Library and therefore not gathered in as hits for statistical purposes.

White (2006, p.11) in his article had commented that “of particular concern has been the tendency of users to see it [Google Scholar] as a scholarly one-stop-shop in the mould of Google itself”. By setting Google Scholar up as a search tool, the Library could be seen as leading its users to believe that Google Scholar was a one-stop-shop. However

the Library catalogue was not able to be one of the targets and this made a large portion of accessible hybrid resources unavailable in these search strategies. He also states that in his opinion "Google Scholar is not an adequate replacement for the existing bibliographic structures and given the manner in which it is constructed it is doubtful that it ever could be. On the other hand it is a valuable supplement and provides both a reality check and a new approach to information searching that it is reminiscent of the impact made by citation indexing in the 60s".

As an interim measure, it was worthwhile putting the time and effort into Google Scholar to maximise its usefulness to the Library's users. However, without access to the same number of datasets, this tool could not deliver the search results that the federated searching service had returned. This lack of results certainly impacted upon the number of full text downloads retrieved by the community of users throughout 2006.

Electronic reserve (e-reserve)

Another factor that may have contributed to the decline in full text downloads in 2006 was the introduction of e-reserve. A working party consisting of Library and academic staff was set-up in December 2003 to begin the task of digitising relevant resources in the course reserve collection. The Voyager e-reserve module was formally introduced to the Library in 2005. Students and staff were building up their expertise and familiarity with this tool during 2005 and 2006. The context in which these resources are being used, as well as the familiarity with this online concept has grown, as has the number of items being placed into e-reserve. Statistics show that in 2006, 154 links were set up to online resources and to date in 2007, 188 links have been created. The Library is currently unable to retrieve usage statistics to confirm user uptake. Minimal promotion mainly by word of mouth and exposure through Library newsletters alerted users to the service.

The resources used in e-reserve consist of –

- links to commercial resources
- links to open URLs
- links to digitised resources (permission granted by copyright holders to change the format from print to electronic).

Edwards (2006, p. 32) commented that this innovation provided the Library "with an opportunity to increase accessibility" to course reserve resources. e-reserve items are available 24/7, and their availability is only impinged if there are not enough simultaneous user licenses available. Access is simplified by the use of module numbers, departments and lecturers names.

Linking to specialised resources within e-reserve reduces the need for students to conduct and construct their own searches. Therefore the serendipity aspect of searching is removed from the search equation and other useful or interesting resources are not discovered. However, for undergraduate students, who make up the

bulk of AUT's student population, they may not have needed or wanted to utilise these additional resources, as they are concentrating on completing the readings that have been set as part of their course work.

In a recent paper researching the ways students conduct their research (Head 2007, p.11) also noted that she "found students: (1) accessed convenient, vetted, and aggregated online resources from course readings and the campus library Web site, (2) to a lesser extent, used Internet sites, such as Yahoo!, Google and Wikipedia, ..." e-reserve certainly fits into this model, as it is able to be conveniently accessed and contains vetted online resources from the lecturers' course readings, and it is available 24/7 from the Library web site. e-reserve is a quick and efficient way for the majority of students to access the e-resources required for study purposes.

Second iteration of federated searching service

In August 2007, the Library launched its new federated search tool, 360 Search formerly known as Central Search. The Library had worked within the LCoNZ consortia to evaluate federated searching service options that were currently available, however it has acted alone in installing this service. Having learnt some very valuable lessons from the implementation of the first federated search service, the Library staff felt comfortable evaluating the range of current products available in the marketplace.

360 Search is one of the suite of Serial Solutions products. It is a hosted service, located on servers in Seattle. At the same time, ArticleLinker, an OpenURL resolver, was installed. 360 Search has also been renamed multisearch by the Library. Retaining the established branding of the federated searching service provided continuity and was important for the Library and its users.

The functionality of the federated searching service has increased and this version of multisearch allows for the creation of clusters that offer multiple points of access to the discovered information. Marshall et al (2006, p.180) stated in their article that "..., federated search alone is not the complete answer. To be most effective, federated search requires a categorization tool, such as clustering." Clustering allows the user to continue to refine their search results without having to re-execute a search strategy, thus saving processing time. Clusters are filtered results arranged in subject groupings. Search results display retrieved results and the clusters take subject headings and group them together, further refining the user's original search (like tags in a Web 2.0 application which are database defined not user defined). The searcher does not have to physically resubmit a search strategy.

The targets are different this time; the Library is using abstracting and indexing databases as well as full text databases, because the link resolver is able to access the full text resources. Utilising the abstracting and indexing databases does mean that not all federated searches will end with a full text result. However, there are more resources subscribed to within the Knowledge Base. The number of targets has increased and, more importantly, the number of targets relevant to the Library has increased. The

biggest plus is that more targets are continually being added. The programming is also more robust and is maintained by the vendor on a regular basis. This ensures that the 360 Search product is a more complete and reliable package.

These differences have changed the in-house Library workflow for maintaining the service. Updates are now undertaken in one place and uploaded into the Library's catalogue. The Knowledge Base is far more user-friendly. From the Library's point of view, as well as offering a total solution this service offers consistency.

Web 2.0 - where to from here?

Web 1.0 is the environment in which libraries have been working by providing resources and access to resources that are still demarcated by boundaries of the physical or virtual library. Web 2.0 removes these boundaries, as Byrne (2007, p.6) states Web 2.0 is "not a technology – it is an attitude." A question which libraries need to ponder is, will students want libraries to be part of their social networks? At present, many libraries are working on the viewpoint that students will. Student uptake of portal technology has been excellent at AUT. The next step will be to provide the means to ensure that different ways of interacting with other like minded individuals is available to students; this may see the students happily adopting Web 2.0 into their AUT learning landscapes.

The main differences between Web 1.0 and Web 2.0 are the interactions of social book marking and social networking. Kroski (2007) comments in her paper that "The social tools of Web 2.0 offer libraries a great many opportunities to interact with their patrons and each other. These new Web applications provide the means to quickly and easily create valuable resources, discover new ones collaborate, keep current, build relationships, and promote programs." By personalising the discovered information by using tags, or writing about the process and the outcomes in blogs, it is when reusing this information issues of credibility are raised within a research environment. Head (2007, p. 8) has written "most participants [in a student survey] doubted whether blogs would ever be acceptable resources to use for college-level research work."

The Library has formed a project team to explore opportunities to utilise Web 2.0 within the workflows of both staff and users, with the intention of a successful transition into the Web 2.0 environment. The first Web 2.0 project is a Library staff wiki, which will be set up using Twiki software. The wiki will be implemented in 2008, making the Library staff work space dynamic

The Library is working with LCoNZ to investigate the delivery of new services that are able to be developed within the legal framework of the anti-spamming legislation, including delivering text messages to students to alert them to reservations they have placed on items within the Library system, overdue items or recalled items.

At present, ILMS and IRAMS systems are being deconstructed. The old model of purchasing every module from one vendor has been disestablished and a pick and mix model is now possible. The AUT Library has a variety of modules that interface together

providing access into a myriad of datasets. Updating the technology behind library catalogues must happen to ensure that they do not become dinosaurs. Libraries and vendors need to keep abreast of the expectations of the Web 2.0 generation of users. This will mean developing dynamic intuitive interfaces that will personalise searches and deliver and display Google-type results.

The latest multisearch tool does fabricate a form of tagging; however, the federated searching service does not fully replicate these social tools – yet. Within the Web 2.0 environment, greater options will become available for searching across a variety of Web applications. This type of searching will become the norm and will give the users the opportunity of leaving enduring tags within discovered resources. If AUT does launch a third iteration of multisearch some time in the next couple of years, it may well be a tool that interacts with all Web applications and knows no technological boundaries.

Conclusion

In January 2008, there was once again a huge amount of curiosity displayed while the e-metric statistics were being collated. As expected these have shown that the utilisation of multisearch for the final quarter of 2007 has increased the number of searches, sessions and full-text downloads.

It is too soon to draw any major conclusions about the launch of the Library's new federated searching service. The service has been welcomed by the users who were saddened by the demise of the first multisearch product and who had learnt to formulate their search queries to simultaneously access a variety of datasets. A watching brief will be maintained on the full-text download statistics during 2008 which will be the first full year in which multisearch will be functioning.

The Web 2.0 environment will also offer the search landscape many new challenges. How library users interact within this new environment and how libraries are able to react to their interactions is yet to be discovered.

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References

- Byrne, A 2007, 'Library 2.0 : an attitude not a technology', CAUL Hot Topic, Adelaide, 20 September, 2007, pp. 6., viewed 2nd October, 2007.
<http://www.caul.edu.au/meetings/caul20072.html>
- Dewe, A 2006, 'What the University Councils funded in establishing LCoNZ. Internal paper to Vice Chancellor, pp. 1-2.
- Edwards, H 2006, 'Electronic reserves: making it happen' *Journal of Interlibrary Loan, Document Delivery & Electronic Reserve*, vol. 16, no. 4, pp. 31 – 38.
- Head, A 2007. 'Beyond Google: How do students conduct academic research?' *First Monday peer reviewed journal on the Internet*, pp. 1-16, viewed 18th September, 2007
http://www.firstmonday.org/issues/issues12_8/head
- Jenks, H., Adams, C., and Rea, C 2005, 'Auckland University of Technology a new Library for a new University' in *Managing information in the Digital Age, the Australian Technology Network Libraries respond*, pp 52 – 67, University of South Australia Library for Librarians of the Australian Technology Network, Adelaide.
- Kroski, E 2007, 'The Social tools of Web 2.0: opportunities for academic libraries', *Choice*, vol 44.
- Marshall, P., Herman, S., and Rajan, S 2006, ' In search of more meaningful search', *Serials Review*, vol. 32, pp. 172-180.
- Murdoch, C 2006, 'Federated search at the AUT Library. Internal paper to Library Executive.
- Organ, M 2006, ' Download statistics – what do they tell us?', *D-Lib magazine*, vol. 12 no. 11, viewed 4th September, 2007.
- Pattern, D 2007, ' Are you happy with your OPAC?' *Update*, vol. 6, no. 11(10), 2007. pp 32-36.
- White, B 2006, ' Examining claims of Google Scholar as a serious information resource', *The New Zealand Library & Information Journal*, vol. 50, no. 1., pp 10 -23.