

## Electronic Reserve – the trial that exploded!

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***Abstract:***

*This paper discusses the trial of an electronic reserve system at the Flinders University Library. In 2000, a committee of staff at the library was set the task of initiating an electronic reserve trial. By mid 2001, the trial had grown from two topics to more than twenty, most of which were added at the request of academic staff. Particular issues discussed include authentication, issues with the Integrated Library Management System and equipment requirements.*

## Introduction

Flinders University is a teaching and research institution located in metropolitan Adelaide. It offers undergraduate and postgraduate degrees in a wide range of disciplines and traditionally attracts a diverse student population. An increasing number of courses offered in flexible delivery mode, co-operative relationships with overseas universities, and greater recognition of the demands on student time have meant that a growing proportion of students will rarely visit a Flinders University campus. WebCT software is widely used for flexible delivery of topics, as are audio and video tapes of lectures.

Of those studying in traditional mode, more and more students find their topics make use of flexible delivery practices, whether they be taped lectures, online notes or email discussion groups.

In this environment, the University Library has been innovative in providing resources and services to students. For four years, the library has provided 100 internet machines for student use in its 3 locations. This has not only provided valuable infrastructure, but has allowed the library to offer increased electronic services on an equitable basis. Collections of electronic databases and journals have been marketed successfully, as have services such as the electronic reference desk and online document delivery request and receipt. The library also began an electronic collection of Flinders University Past Exam "papers". This was structured in much the same way as an electronic reserve using a simple in house database. The system was embraced to the point where duplicate print copies are no longer held by the library.<sup>1</sup>

The only factor preventing the introduction of an electronic reserve system prior to 2000 was copyright, or more accurately, the lack of resources available to satisfy requirements of the copyright regime at the time.

In 2000 the agreement between the Australian Vice Chancellors Committee (AVCC) and the Copyright Agency Limited (CAL) for a reasonably priced Part VB license opened the way for progress on this project. This license permits digitization and dissemination to students of scanned material, subject to limits. Flinders was not able to move immediately after the adoption of the new license because it was adhering to a record keeping arrangement at the time and thus did not gain the benefits of the new license conditions. However when the University adopted a sampling system the Library was able to immediately commence work on the project. By July, a committee of staff was assigned the task of investigating electronic reserve, with the view of having a working "mini-version" running by the end of the year.

This practical approach was very successful. Working by trial and error, and pooling the existing knowledge in the library, the committee was able to have Electronic Reserve, on a very small scale, operating within a couple of months. Issues that were flagged at the beginning of the project as being problematic, including authentication, were sorted out fairly rapidly, while more and more unforeseen obstacles presented themselves. Many of those relating to workflows and equipment were not in the brief of the committee to solve, however, hands on experience of the system resulted in valuable recommendations in these areas. This experience on a small scale was seen as invaluable in planning for larger scale implementation.

The Library has a representative on each faculty Flexible Delivery committee of the University. As Electronic Reserve took shape, it was demonstrated to each committee to highlight its potential as a teaching and learning tool. The benefits were immediately obvious to each committee. Within weeks, academics teaching in Flexible Delivery mode were contacting the library requesting to have materials for their topics added to the system.

The popularity of the system amongst academic staff meant that this trial is not one that could be “turned off”. It’s more accurate to say it exploded.

### **The Task Set**

The committee was formed in July 2000. It included staff with varying levels of responsibility from different sections and branches of the library. The chair was authorised to consult with and co-opt any other library staff.

The aim was to have a small electronic reserve operational by November 2000 that could accommodate library materials whether originals were available in print or electronic form, that had a simple authentication procedure compatible with other systems in the university and that was easy to use. It was envisaged that a maximum of three topics would be added to electronic reserve for the purposes of the trial and that setting up such a system would enable the committee to flag potential problems with electronic reserve.

Committee members were to negotiate for the use of existing library equipment in various areas, and some funds could be made available for software purchases if necessary. Given that the library was at the same time looking to purchase a new web-based integrated library management system, it was important to keep in mind that while any identification of software would be important in the short term, the new ILMS would be likely to have electronic reserve capabilities. Consequently, identification of idiosyncrasies in the particular system was not as high a priority as looking at equipment requirements and implications for staff and students.

### **Preserving the intellectual integrity of the Reserve Collection**

The primary requirement of the Electronic Reserve Collection was that it must have intellectual integrity. It was essential that it be possible for any material prescribed by a lecturer to be made available in this way, within the limits of copyright law. To preserve the integrity, it is the lecturer who should control what is on reserve, not publishers, copyright holders, or librarians.

Some models for electronic book borrowing library systems look attractive as possible electronic reserves systems, but lose intellectual integrity, as materials are restricted to particular copyright holders or publishers<sup>2</sup>. The restriction on available materials means that in theory, lecturers could be compelled to choose materials from certain publishers to ensure electronic access for their students. If such a system were in place, it could result in parallel reserves, where material from some publishers would be available electronically, while the rest would be available in a conventional print reserve, or indeed in other electronic collections. In much the same way as collections of electronic journals cannot be turned into a reserve collection, nor can these collections of electronic books.

Our own electronic past exams collection is closer to an electronic reserve, that is, providing access to materials electronically by course number. It is, however, restricted to past exam “papers” for which the university holds copyright. This is a collection defined by the type of material, and the copyright holder.

Earlier attempts at true electronic reserves were thwarted by copyright requirements. For example, some libraries sought to develop an electronic reserve by contacting the copyright holders for each item destined for the system and ask permission to make an electronic copy available to users. Again, it was ultimately publishers or copyright holders deciding which materials could be held in electronic reserve, not teaching or library staff.

The provision allowing digital copying of collections under the AVCC-CAL agreement immediately opened the way for an electronic reserve where the control rested to a much greater extent with teaching and library staff. Any material held in print by the library could be scanned and added to an electronic reserve system without the need to consult individual publishers, provided the legal provisions were met. While electronic materials were not covered by the CAL agreement but by individual licences, it was only a matter of examining the licences to clarify the library’s position. In all cases, materials from these collections could be added to electronic reserve.

By making any material held by the library, whether in print or electronic form, a candidate for electronic reserve, the CAL agreement and licences made it possible for the collection to have an intellectual integrity and openness similar to that which has been traditionally achieved in paper reserve collections.

## **Authentication**

Authentication was identified as an important issue to resolve. It was clear that electronic reserve would need a security system in place, especially as it was essential to make materials available to off-campus users. The prominence of the authentication provision in the amended Copyright Act bore out this view.

The library was reluctant, however, to add yet another security hurdle for users to overcome. While Flinders is working towards a streamlined system of user authentication for all its systems, from student records to library materials, it was not yet in place at the time of the trial. Most electronic library materials have IP restricted access, making on-campus access simple. Off-campus users, however, must use different passwords for each database or electronic collection.

The preferred outcome was to set up authentication from the library’s patron file using student barcode number only if students were logging direct into the electronic reserve system, or to allow students that were using the university’s online education system, WebCT, to seamlessly access electronic reserve. It was also a priority to ensure that once students had entered the electronic reserve system, there would be no need to re-authenticate when following links to materials available in electronic journals.

## **Integration with ILMS**

It was important that electronic reserve not develop completely separately from the existing integrated library management system. Any electronic reserve system would be likely to

generate its own holdings records and these records would need to be transferred efficiently to the ILMS, to prevent users needing to check the library catalogue and a separate electronic reserve catalogue.

For the purposes of the trial, electronic reserve would need to become another collection in the library, with its own codes and identifiers on the ILMS. From a systems point of view, it would need to be adaptable enough to make the transfer of records to the ILMS an automatic operation.

## **Workflows**

In a library made up of a central collection and three branches, all with their own print Reserve Collections, the impact on workflows of an electronic reserve was going to be significant. For the purposes of the trial, however, the committee was to work in existing workflows wherever possible, and flag in its report suggested changes.

The position was further complicated by the fact that each library had slightly different procedures for print reserve due to historical and environmental factors.

## **The Task Performed**

### **Free Reserves**

Soon after its formation, the committee identified suitable freeware for the trial, on the recommendation of the library systems department.<sup>3</sup> FreeReserves was developed at the University of Minnesota Libraries<sup>4</sup>, and has suited the purposes of the trial. (<http://www.lib.umn.edu/san/freereserves/>) FreeReserves offered the following features:

- It was web based, utilising forms for the entry of course and bibliographic data
- It was database driven and created the e-reserves web site dynamically based on this data
- Bibliographic information was only entered once, could be used in multiple ways, and could retrieve that data in subsequent semesters
- It could remove reserve readings at the end of the semester without staff intervention, as well as allow administrators to place a reading on reserve for as little as a day and then remove it without staff intervention
- It authenticated user access to readings through an easy to use password
- It had a browse and a keyword search feature that allowed users to search for courses and lecturers
- It produced a log file to evaluate usage patterns
- It could handle a variety of file types such as PDF, DOC, XLS, PPT, ZIP, as well as links to web based material
- It could manage copyright compliance information
- The data was stored in non proprietary format and could be formatted for import into the existing ILMS
- Items with a course could be ordered under arbitrary headings (for example, Tutorial 1, Essay Topic 3, Please read by...)

Some modification was required to badge it as part of the Flinders University Library, and certain terminology was changed to suit usage at Flinders, eg “Professor’s instructions” were changed to “Lecturer’s instructions”. The systems department of the library drafted code which allowed FreeReserves to “talk” to the existing Unix-based ILMS, resulting in the automatic uploading to the ILMS of any records created on FreeReserves. In this way, the ILMS remained a true reflection of the library’s holdings. If the records created on FreeReserves were not transferred to the ILMS on a regular basis, both systems would be working in parallel, and the ILMS would no longer reflect all holdings available.

All items added to FreeReserves had an expiry date, usually the end of semester, after which they would no longer be available to users without intervention from library staff. This feature, while adding to the administrative load of reserve staff, was useful in light of communication restrictions under the Digital Agenda Act.

## **Authentication**

The authentication model used in the library for other web based services such as online Document Delivery requesting was used again for the electronic reserve trial. This system works by extracting a file of patron information from the library ILMS each night. Users are asked to supply some information, usually a library barcode number, and are authenticated when it is matched in the file.

If a user was already logged on using WebCT, the university’s online education system, the authentication into electronic reserve was accomplished by the HTTP\_REFERER Environment Variables. To retrieve a document, a request was passed to the server. If the HTTP\_REFERER variable matched and was “authorised” by the server, the electronic reserve internal authentication was bypassed and the transaction was allowed.

Once logged into Electronic Reserve, users could follow links directly to an article housed in a publisher’s collection of electronic materials where the authorisation could be embedded in the article URL. In cases where this was not possible, the required username and password was displayed as part of the electronic reserve record.

## **Equipment**

The committee identified scanners currently used in the library for Document Delivery of materials via Ariel. After negotiations with Document Delivery staff, committee members in both the Sturt and Central Libraries were able to use a flatbed scanner to scan direct from periodicals and books. Scanned documents, in Multi-page TIFF format, were then saved to another workstation loaded with Adobe Acrobat. From this machine, the TIFF files were converted to PDF. This was obviously quite inefficient, but the machine set up with Adobe Acrobat was for the purpose of scanning exam papers, and was not partnered with a flat bed scanner. To photocopy materials and then scan them direct to the Adobe Acrobat machine would have been less efficient.

As FreeReserves was web based, and all committee members had desktop web access to the web based administration interface, there was no need for extra equipment in this area.

WWW servers were already in place for other library services. There were implications for server space, but room was made available by adding another disk for the purposes of the trial. As work had been done in developing the collection of Flinders University Past Exam “papers”, there were standards in place for the scanning of materials to ensure the minimum bandwidth consumption.

As electronic reserve grew, the library invested in a Ricoh Aficio 270 digital copier/scanner/printer and upgraded an existing server.

## **Workflows**

The initial aim was to keep workflows in the library as close as possible to that used in paper reserve. This proved impractical given the training implications.

The Central Library paper reserve service is maintained by staff responsible for the collection of materials and creation of reserve records. These staff also spend some time at the Reserve Collection service point. Photocopying of materials for Reserve is in most cases undertaken by another staff member in the Multimedia section of the library.

To keep paper reserve workflows, reserve staff would need to have been trained in the use of a flat bed scanner, Adobe Acrobat software and FreeReserves. They also would have needed upgraded PC skills to retrieve and transfer files over the network and would need more time spent away from the Reserve Collection service point.

It was felt that for the duration of the trial, it would be more efficient for committee members to undertake all these tasks rather than train additional staff. It was also valuable for committee members to identify issues from their own experience.

## **Copyright and the management of intellectual property**

The Part VB license is subject to limits regarding the amount of material that can be digitized and how it must be handled. One requirement is that the material must only be available to staff and students and this requirement was met by the authentication procedures mentioned above. Restrictions are also placed on the amount of material that can be copied from a book or a journal and these were met by having an entry on the catalogue that created a common point at which what we had copied could be identified. Staff involved in placing material on to electronic reserve could check against the catalogue to ensure that the Library acted within the terms of the Part VB license.

Scanned material that is made available for more than twelve months is deemed to have been communicated more than once to the users and will ultimately be subject to extra counting in any sampling process for remuneration. Details of how the remuneration process will work, and what records, if any, libraries operating under the Part VB license must keep, remains to be determined.

## **Explosion**

What started as a two-topic project grew incredibly quickly as word spread throughout the university. The system was demonstrated to each Faculty-level Flexible Delivery committee.

By the end of each meeting, it was clear that Electronic Reserve was a teaching and learning tool that academic staff wanted to integrate into their topics at the first opportunity.

In many cases, academic staff approached the library and requested that materials be added to Electronic Reserve. As this was meant to be a small trial, with a maximum of three topics to be included, it was clear that the library was not equipped to supply a complete Electronic Reserve service on the scale demanded. The main impediment was lack of a structured workflow and trained operators. The flat bed scanner used for the trial was only available by agreement with the Document Delivery service. To undertake the scanning required would have impacted on the efficiency of the Document Delivery service, as well as that of committee members in their other day to day tasks. While the library did invest in a Ricoh Aficio 270 digital copier/scanner/printer and train more staff, the demand was unexpected. As a compromise, the library placed materials on electronic reserve, provided academic staff arranged scanning of material.

What started as a trial of two topics in August 2000 grew to an electronic reserve system accommodating sixty-one topics, both undergraduate and postgraduate, over a variety of subject areas.

\*see appendix A

## **Consequences**

The Electronic Reserve Trial cemented the Library's position as a partner in the flexible delivery of courses. By taking an innovative approach to core business, the library was able to present to teachers a product that fitted their needs and offered a solution to long-standing problems. Obviously, the trial was embraced enthusiastically by academic staff.

This popularity of the system was not, however, without drawbacks. In some cases, electronic reserve did not present an improvement in the delivery of services. In one case, course materials for a first year internal topic were made available only via electronic reserve. This, coupled with the absence of a faculty computing lab, put considerable pressure on library staff and students as high numbers tried to access materials without appropriate infrastructure or training. Network printing facilities in the library could not cope, resulting in duplicate print copies of materials being made available via traditional reserve. For the system to work on this scale, with first year students, there would need to be considerable investment in printing facilities both inside the library and in computing labs. More support and training would be required for students on and off campus taking into consideration the wide variation in computer competencies in the student community.

Clearly, this level of use was inappropriate for a trial, and was a near impossibility without equipment and training in place to support students.

The library was able to include more materials on electronic reserve by taking up academic staff offers to arrange scanning. In doing so, however, the library lost control of quality in this area. Scanned documents were not always legible, and in some cases bibliographic detail accompanying files was inadequate. In some cases, inaccurate scanning meant the size of PDF files grew unnecessarily large. This is unacceptable in the long term, as it is the library that is ultimately responsible for the quality of its service. By "outsourcing" in this way,

quality was compromised. As the library was constrained by a lack of resources, there was no practical way to address this during the trial. With further investment in equipment and staff training, it would be possible for library staff to retain responsibility for scanning materials, and therefore have complete control over quality.

Investment in equipment and staffing to take electronic reserve from a trial stage to full scale implementation will resolve these matters. The less quantitative implications are those facing the university as a whole.

Electronic Reserve will make flexible delivery of education even more attractive to students at a distance or with commitments that make on-campus study unworkable. Students will no longer need to wait for print materials to arrive by post, but will be able to access them online. There will be no chance their materials could get “lost in the post” or arrive too late. For students on campus, electronic reserve will mean less time spent retrieving and photocopying materials. They will have the convenience of collecting readings wherever there is equipment, be that in the library, in a computer lab, at home or work.

For teachers of external topics, electronic reserve will give them the freedom to assign readings knowing that materials will be available to their students as an integrated part of the topic. This ease of access will allow teachers to design courses in innovative new ways and look beyond the traditional separation of lecture notes, tutorials and readings. This is likely to follow on to more innovative teaching methodologies for topics delivered in traditional ways.

For the University, Electronic Reserve offers a solution to the complexities of copyright law compliance. Given full co-operation, Electronic Reserve could be a university wide depository for copyrighted electronic materials. This would not only offer the security of password access to authorised Flinders students and staff, but would also have the reporting capabilities essential to ensure compliance with the law.

## **Conclusion**

It is clear that electronic reserve is not something that will be abandoned at the Flinders University Library. It will change considerably with the introduction of the new ILMS, when the administration is likely to be transferred to that software. As the library invests in electronic books as well as journals, it will become a viable alternative to traditional paper reserve. The astounding response to what was meant to be a small trial indicates that electronic reserve is something required by the university community, and will become essential for teaching and learning.

The issue to consider now is whether publishers and software developers will do their part to help fine tune the electronic reserve services offered by libraries. As Electronic Reserve still operates under provisions of the Copyright Act, only one chapter or ten percent of any book may be copied. This means that text books cannot be added to Electronic Reserve in their entirety. If publishers were to make electronic versions of texts or e-books available with attractive licence provisions that allowed for whole books to be available on electronic reserve, this problem could be solved. Changes to the licences and design of journal compendia could also assist by allowing easier authentication and linking direct to articles.

Those issues aside, electronic reserve is core business for libraries and the explosion of the trial at Flinders University has served to reinforce the importance of the library in teaching and learning.

## Appendix A

Electronic Reserve usage statistics for 2001

Downloads of scanned articles (does not include access to articles in e-journals)

January	297
February	702
March	6339
April	1999
May	1928
June	1889
July	439
August	771
Total	14364

Source of transactions

Off campus	7757	54%
Library	2729	19%
Other on campus	3878	27%

This level of usage reflects approximately 15-20% of our peak paper reserve load in 1999.

## Endnotes

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<sup>1</sup> See <http://www.lib.flinders.edu.au/resources/eres/exams/>. Electronic copies of exam papers were initially scanned from paper copies. In recent years, faculties have been encouraged to email electronic versions direct to the library.

<sup>2</sup> See <http://www.netLibrary.com>. NetLibrary sells collections of electronic books, hosts them on a server and allows each book to be “checked out” to a patron. The system mimics conventional circulation systems in that only one patron may use a copy of a work at a time. Libraries are offered flexibility in the choice of texts, “borrowing times” and report generation, but intellectual integrity is compromised in that only books from consenting publishers are available.

<sup>3</sup> The library systems department scanned the ARL Ereserve Forum (<http://www.cni.org/Hforums/arl-ereserve/about.html>) and surveyed the specifications of commercial products, such as offerings from Docuteck (<http://www.docutek.com/>). None at the time met the requirements of the trial as well as FreeReserves.

<sup>4</sup> See <http://www.lib.umn.edu/san/freereserves/paper.html>