



10th Interlending and Document Supply Conference

Resource Sharing for the Future
Building blocks to Success

Singapore, 29th – 31st October 2007
www.nlb.gov.sg/ilds

Was Automation the answer?

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Abstract

In 2006 the Document Supply Service at the National Library of Australia began its automation project. There were two main objectives: firstly to improve the services to customers measured by turnaround time; secondly to streamline interlibrary loan and document delivery (ILL/DD) workflows.

Eighteen months later, what efficiencies have been gained? This paper will explore the changes introduced as a result of automation. We will report on the improvements made to workflows, customer services, and overall benefits.

Introduction

Interlibrary loan and document delivery (ILL/DD) workflows are one of the most difficult processes to automate in the library environment. ILL/DD practitioners are required to make complex decisions involving the condition of the material, copyright, library policy and a myriad of other considerations before material can be made available for loan or copy. This information then needs to be exchanged between the requester and the supplier. Communicating this information is easy for people but is quite difficult for systems. While it is easier when this communication occurs within an ILL/DD network service such as OCLC's WorldCat Resource Sharing (WCRS) or Libraries Australia Document Delivery Service (LADD), sophisticated standards are required to enable two ILL/DD management systems to interoperate. The ISO Interlibrary Loan (ILL) protocol has been fundamental in enabling libraries to automate their interlibrary loan services and interoperate with other ILL/DD systems and networks. The development of ISO ILL protocol compliant ILL/DD management systems has given libraries the option to use a network such as Libraries Australia Document Delivery (LADD) and/or to implement a local ILL/DD management system. The decision is up to the library and is based on individual requirements. Due to the range of services managed by the Document Supply Service, the National Library of Australia adopted the second option, to implement an ISO ILL management system. In 2005 the Library went out to tender and purchased the Relais Enterprise system to automate all ILL/DD requests from both individuals and libraries. This paper reports on the impact of automation, what efficiencies have been achieved and what still needs to be done.

Background

Australia is a large country 7,617,930 square kilometres with a population of 21,000,000 million people. Distances are vast, the population spread out and no library is able to collect all of the material users will require. As a result, the Australian library community has a long

history of cooperation and resource sharing. It has taken many years to develop the infrastructure necessary to support resource sharing, however developing the systems necessary to support peer to peer interlibrary loan/document delivery services has taken longer. This Infrastructure¹ requires a number of components:

- a **national union catalogue** - the Australian National Bibliographic Database, provided by the National Library of Australia since 1981 lists over 41.5 million holdings as of July 2007, covering the collections of almost 1,000 Australian libraries
- a **national document delivery system** – the Libraries Australia Document Delivery (LADD) service provided online since 1989, allows participating libraries to exchange requests and since 2002 via the ISO ILL protocol². There are currently over 800 participants in the network.
- a **national agreed standard** setting out the service standards and recommended charges – the Australian Interlibrary Resource Sharing (ILRS) Code adopted in 2001 and reviewed in 2006 in addition to setting out the service levels and recommended charges, it includes principles and guidelines and
- a **national payment management system** – the Libraries Australia Document Delivery Payment Service was developed in 1993.
- a **standards protocol** - ISO ILL project to enable peer to peer communication.

Since the very beginning, the National Library of Australia's Document Supply Service participated in the Libraries Australia Document Delivery Service and its predecessors, taking advantage of the efficiencies this technology allows. However not all Australian Libraries participate in this service nor do many overseas libraries resulting in different workflows and procedures to process requests from these libraries. The Document Supply Service receives requests from OCLC, RLG Shares, LADD, Email (from Overseas and Australia libraries), fax and, although now very infrequently, via mail.

The last 10 years has seen significant changes to the ILL/DD environment with an increasing volume of material in electronic format, rapid expansion of the internet, higher user expectations and ever changing technological developments. All of these are impacting on interlibrary loan and document delivery units which have to adapt to provide relevant services to their users.

¹ The Australian Bibliographic Network (ABN) was launched in 1981 by establishing an online union catalogue offering primarily copy-cataloguing information and libraries could register their holdings information. Union catalogue entries were also added and as more libraries joined this became an invaluable resource to ILL/DD practitioners. In 1989 the ILL/DD module was added permitting ILL/DD departments to search locate and place requests online for the first time as a single process. In 1993 the payments service was introduced to broker the payment of ILL/DD requests between libraries. In 1999 the ABN service was replaced by the Kinetica Service based on new more modern technology. This service was in turn renamed the Libraries Australia Service in 2005. For more information on the Libraries Australia Document Delivery and Payment service see <http://www.nla.gov.au/librariesaustralia/docdel.html>)

² The ISO ILL protocol refers to the three individual standards in the suite of ILL application standards: ISO 10160:1997 Information and Documentation - Open Systems Interconnection - Interlibrary Loan Application; ISO 10161-1:1997 Information and Documentation - Open Systems Interconnection - Interlibrary Loan Application Protocol Specification - Part 1: Protocol Specifications and ISO 10161-2: Information and Documentation - Open Systems Interconnection - Interlibrary Loan Application Protocol Specification - Part 2: PICS Proforma. Retrieved on 24 July at <http://www.collectionscanada.ca/iso/ill/standard.htm>

In 2001 the National Resource Sharing Working Group and the National Library of Australia undertook a major benchmarking study³ of Australian libraries with just under 100 libraries across sectors participating in the survey. The survey identified the key factors to maximise performance as:

- Examine workflows to ensure there are as few steps as possible
- Implement an automation package
- Ensure ILL/DD staff are well trained in resources and systems
- Add and maintain holdings on union catalogues
- Investigate cooperative agreements with key libraries.

Although the Document Supply Service at the National Library of Australia has introduced technological changes over the years to improve work flows, by the end of 2005 the interlibrary loan and document delivery operation was still predominantly manual. Requests were being received through a number of different systems such as OCLC's WCRS, LADD, and ILL manager, as well as email, Loan-some Doc, fax, mail and the odd telephone call. While request management and, payment management were partially automated, statistics collection and request administration were largely handled manually. This resulted in complex workflows with numerous procedures which had to be documented. Training for new staff and keeping existing staff up to date with the changes was challenging. Automation of interlibrary loan and document delivery management provided the only viable solution to integrate all of the different requesting methods and simplify workflows.

The Library was looking for an automation solution that brought together all of the different processes into a single system, that could handle both library and user requests. The "Relais Enterprise" interlibrary loan management system was selected. It was seen as having the potential to significantly simplify the existing work flows and assisted in managing financial transactions.

Implementation of Relais commenced with the launch of a Relais Web interface in December 2005 to manage requests received by email. This enabled libraries not using interlibrary loan systems to enter and monitor the progress of their requests to the National Library online. The second implementation phase involved integrating requests from users into Relais and in February 2007 changes to allow requests from the Copies Direct service⁴, to be transmitted to Relais were implemented. This allows requests from Copies Direct to be converted to XML and added to Relais via the "Add Request Service". This includes bibliographic information, delivery and payment details. After a lengthy testing process and upgrades to both systems, the third and most important phase was successfully implemented when in April 2007. Relais began to interoperate with the Libraries Australia Document Delivery system (LADD) through the ISO ILL protocol. To date over 90% of all ILL/DD requests received by the National Library's Document Supply Service, are processed and managed by Relais. The final phase of the project will allow **interoperation** with OCLC and is due to be completed before the end of 2007.

³ The ILL Benchmarking Study was undertaken by the National Library of Australia for the National Resource Sharing Working Group. The results of the study can be found on the National Libraries website at <http://www.nla.gov.au/initiatives/nrswg/benchmarking.html>.

⁴ The Copies Direct Service is a fast, easy and inexpensive way for users to get copies of books, articles, chapters of books, photographs, pictures, maps, manuscripts, music, sound recordings from the National Library of Australia Collections. It is available directly from the website and from the various Library catalogues <http://www.nla.gov.au/copiesdirect/>.

Programme

What has been achieved through the automation? Was it the answer?

Workflows

So what did Document Supply Service staff do to manage ILL/DD requests before automation? And how did the workflows change after the Relais implementation.

Request management

Requests from both online and off line sources need to be printed to retrieve material for copying or loan. The National Library's policy is to leave a call slip/pick-list (copy of the ILL/DD request) in the stacks to indicate material has been removed from the shelf. Therefore two copies of each request are printed, one for the shelf and one for processing. The call slip or picklist is printed on A5 sized paper as it is easier to handle.

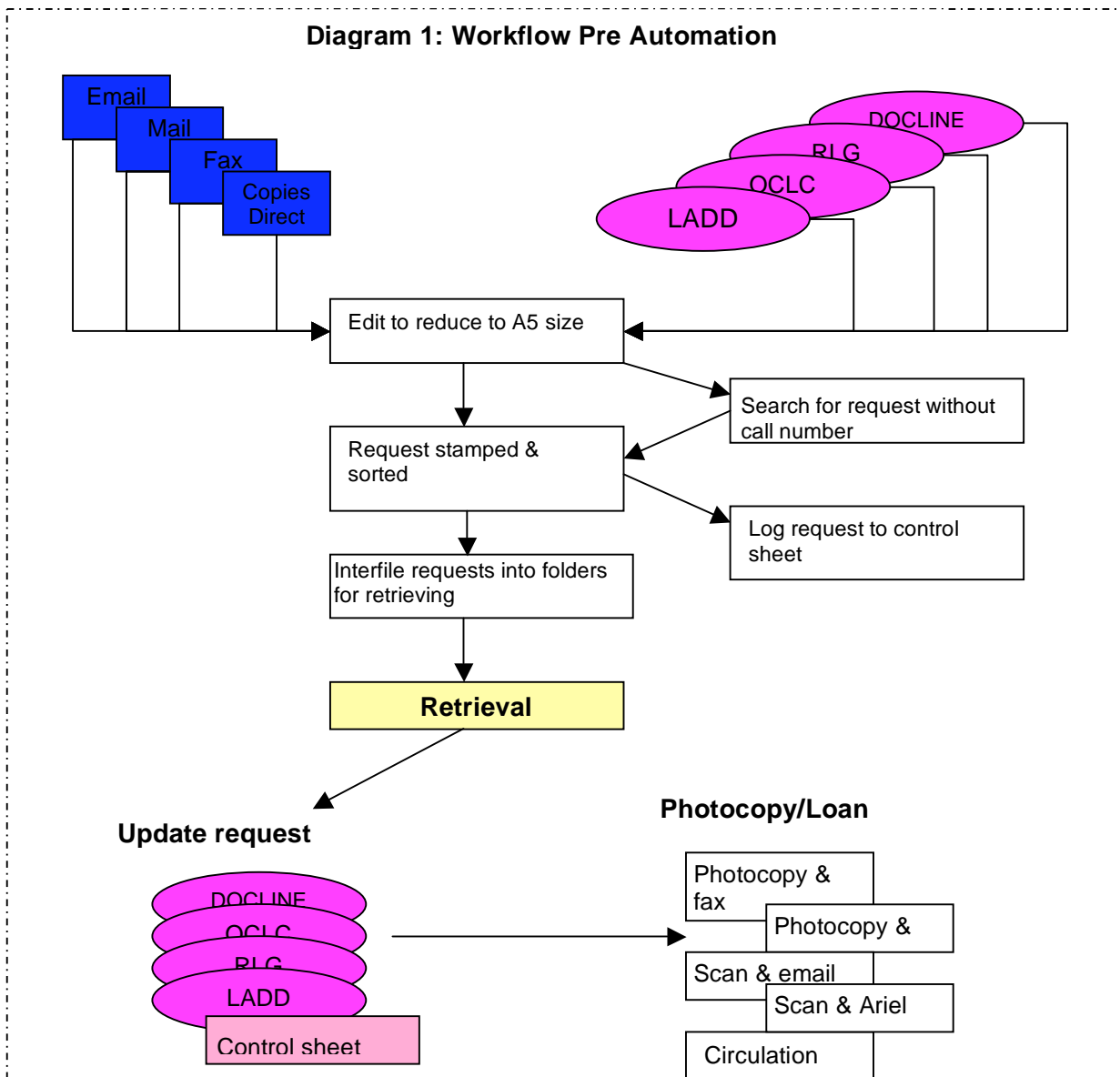
Over 60% of interlibrary loan requests are received from Libraries Australia Document Delivery (LADD) participants. The service is primarily used by Australian and New Zealand libraries and includes all of the State and University libraries and many government, special and public libraries. Before the implementation of Relais these requests were downloaded and a macro was run to edit the requests to fit the A5 size. About 10% of requests are received via overseas ILL systems i.e. OCLC, RLG and Docline and these were printed separately. Between 20 – 30% of requests are received via email including the requests from individual users through the Copies Direct service. These requests were edited to allow printing on A5 paper. There were also a small number of requests received via fax and mail which were usually reduced in size as they were photocopied. In addition, to all of this editing and photocopying separate control sheets were used to monitor progress of requests received through the Copies Direct service and to control urgent requests Staff were required to enter request details and update the information as the request progress through the section.

Once the requests were printed, they were sorted by stack location and Dewey decimal classification by three different staff members and on average taking 45 minutes each day to complete the task. In addition to sorting the requests, these staff members also check the different catalogues for call numbers where these were not provided by the requester, they also stamped delivery method required and highlighted requesting library symbol, and then interfiled all of the requests received via the different systems into folders for retrieval. Requests for special collection material are handled by the different Specialist Reading Rooms as there are often complex copyright and permission issues to be sorted before the material can be made available to the user or library. These requests were either faxed or delivered by a staff member to these units

After retrieving the material from the shelves, staff would update the LADD and OCLC requests in the online systems to indicate the material was supplied. The item would then be scanned using the Ariel software or photocopied. For loans the item would be entered in the circulation module on the National Library's library management system, Voyager. For requests received via email or mail it was too costly to notify when the material was despatched. When the Library could not supply a copy or loan, online systems would be updated to indicate non-supply. If the request was received via email, the inbox would be searched to locate the request and a non-supply response would be sent. For Copies direct

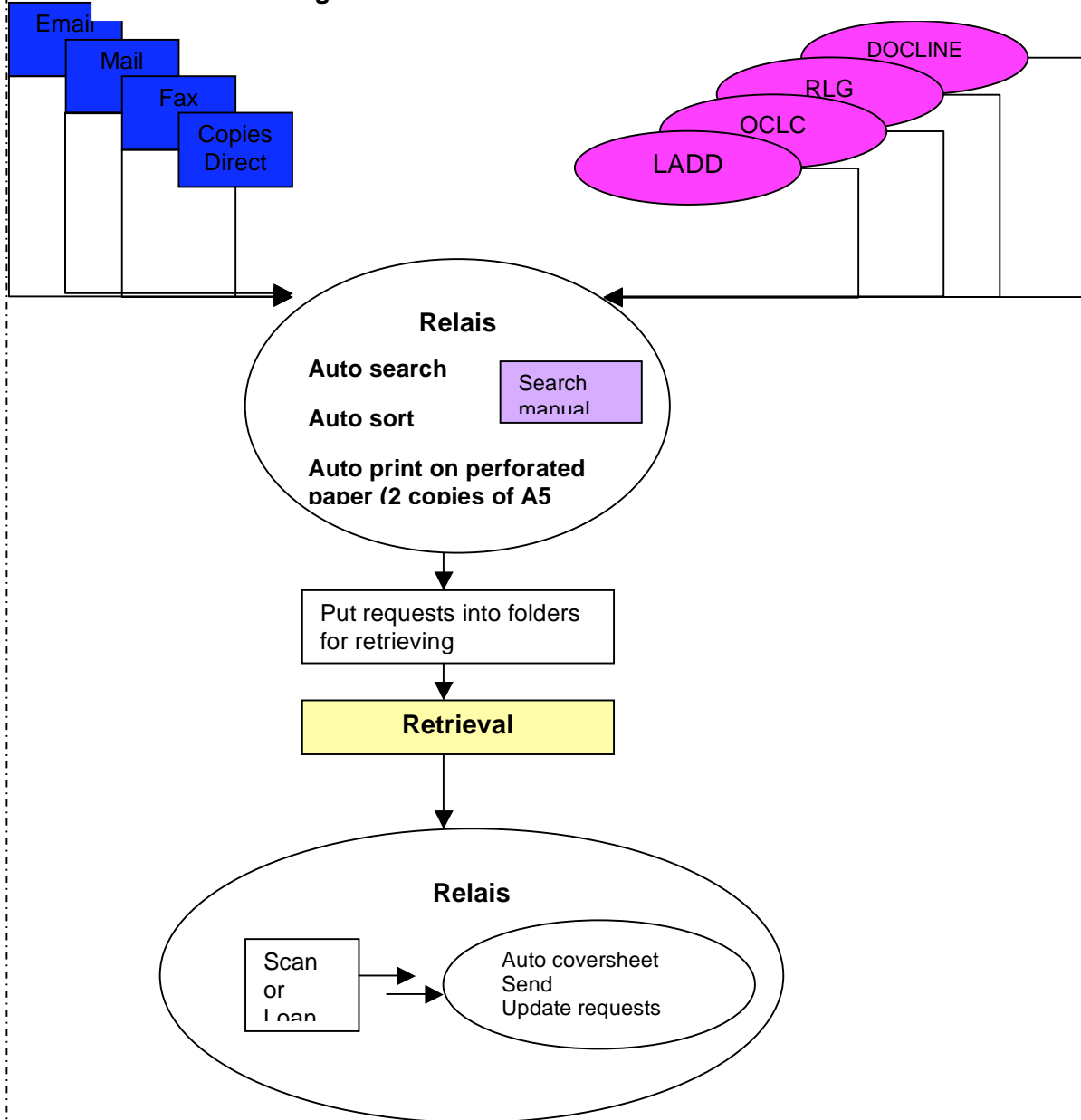
and urgent requests the control sheets were amended to reflect whether the item was supplied or not.

Diagram 1 depicts the workflow before automation.



What are the major changes to workflows that have occurred since the introduction of Relais? There have been major changes to searching the catalogues, sorting requests, communicating with libraries in general, printing requests and cover-pages and delivering copies, as indicated in the Diagram 2.

Diagram 2: Workflow After Automation



Since the introduction of Relais the process begins with libraries sending requests via LADD, through Copies Direct or via the Web form. Once the requests are received or entered in Relais, the system performs a search automatically against the Library's Voyager catalogue and assigns call number and stack location if there is a one-to-one match found, and then moves these requests to the appropriate print queues. If the system finds no match or multiple matches, it sends the requests to the "Search Manual" queues where staff members who monitor these queues perform a Z39.50 search against the Library Voyager catalogue and/or the national union catalogue (Libraries Australia). When the appropriate location is found, the requests are routed to print queues if held by the Library. Alternatively

if the item is not held by the library it is now possible to send a “non-supply” message immediately. If a library or user wishes the National Library to pursue the request further it is now possible to do so and monitor progress through Relais.

Relais automatically sorts requests by stack location and Dewey Decimal classification before printing them twice on A4 perforated paper. The frequency of printing is configurable depending on the printer location and/or the service level required. Urgent requests are printed immediately while normal requests are printed at certain times of the day in order to bundle requests for the same stack area together to facilitate retrieval. Requests for special collections are distributed immediately by the system eliminating the need to fax or deliver these requests to these areas for processing. The implementation of Relais has reduced paper costs, and staff time as photocopying requests and sorting is now carried out automatically by the system.

After retrieving the material, instead of updating requests on the different systems and then scanning or photocopying, staff can now scan the material and the request is automatically updated to indicate the material has been supplied as soon as scanning process is completed. As Relais has scanning facilities scanning and request updating is a single process. Relais also has “Email post to Web”, where an email is sent to the requesting library or user with a link to the material on the Library’s website. Administratively, there is no longer a need to maintain control sheets or other forms of documentation. Relais keeps all of the information required to manage the requests and allows staff to add notes as needed for example to record the outcome of a conversation with a colleague regarding their request. Relais also prints barcodes on each request so searching and updating requests is very simple, efficient and less prone to error.

Payment management

Charges apply to all interlibrary loan and document delivery requests supplied by the National Library. These charges are based on the recommended fee structure outlined in the ILRS Code⁵ which lists the base charge for a “Core” request plus the surcharges for the number of pages, delivery method, and urgency. In addition, there are separate fee structures for overseas libraries and the National Library’s Copies Direct Service to individual users. Usually a cover-page accompanying the material is sent to the requesting library or user. The cover-page includes the request details, the charges and in the case of users a copyright statement.

Due to the complex nature of this charging structure, before automation, a number of different cover-pages were maintained by the Document Supply Service. Staff were required to use different cover-pages depending on the service level, number of pages and where the library requesting the material originated. They were also required to alter the charges on the form to reflect the service level, delivery method and location of the library i.e. Australian or overseas. Copies Direct users pre-pay therefore a separate cover-page was required for these requests.

In addition, there are a number of different payment methods.. LADD, Share or OCLC IFM participants are charged automatically via the payment services provided by these services. Other libraries are invoiced at the end of the month and Copies Direct users pre-pay either

⁵ The ILRS Code recommends a maximum of 4 working days for core requests, 24 hours for Rush requests and 2 hours of express requests. For more information see <http://alia.org.au/interlibrary.lending/ilrs.code.html>

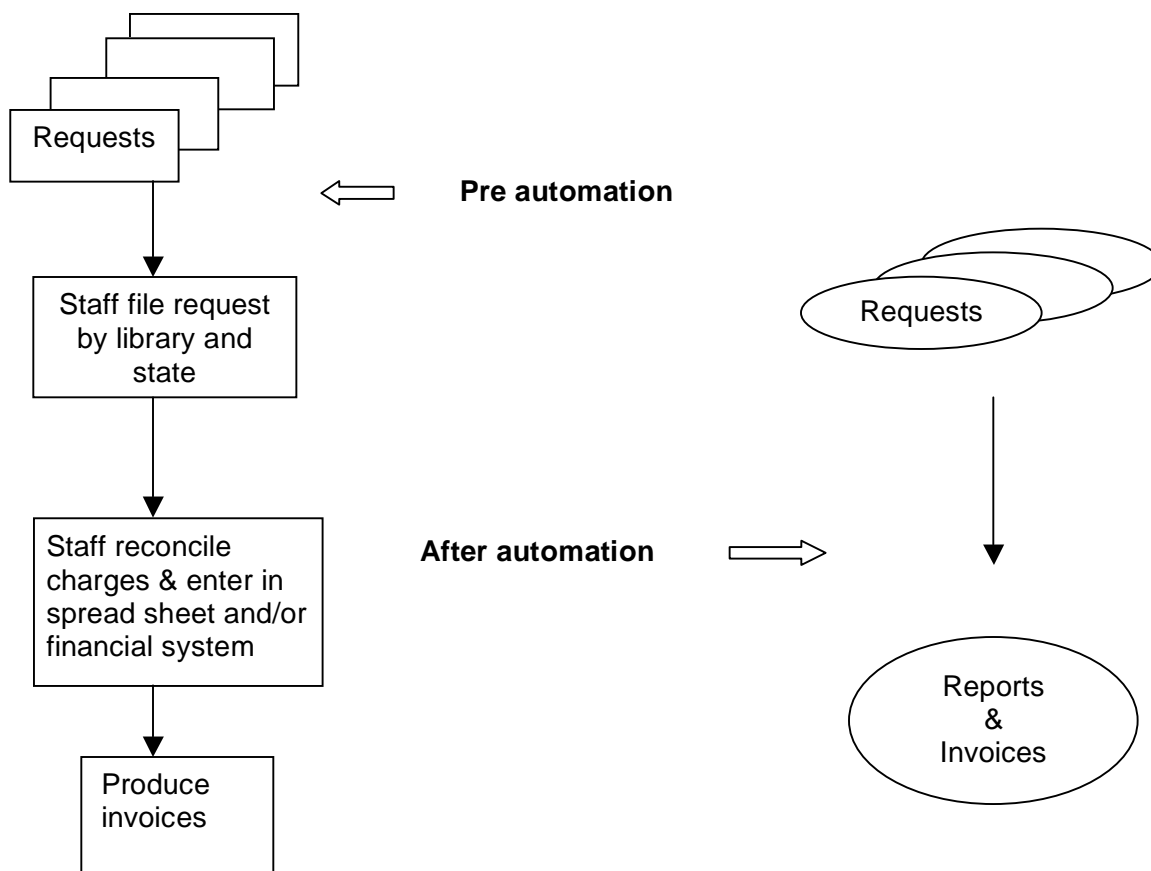
via credit card or via cheque/money order. Document Supply Service staff process the credit card payment weekly and issue invoices monthly. Prior to the automation, a hard copy of each request had to be kept for the purpose of processing payments (for some requests this meant ensuring three copies of the original request were printed: one for the shelf, one for processing and one to send with the invoice to the requesting library for information). The requests were filed and bundled; charges were calculated and recorded in a spread sheet and/or the financial system. The invoices were then printed and sent to the requesting library with a copy of the request. On average, the invoicing processes took three FTE⁶ days each month.

Relais has changed all of this. Firstly it automatically calculates the correct charges and adds the request information to produce the coverpage. This can be printed or delivered electronically depending on the delivery method selected by the requesting library. Secondly, reports have been created to extract payment information from Relais for both credit card payment and invoicing. At the end of each week the credit card report is run to produce a list of charges to be made for Copies Direct requests. Prior to automation each section handled Credit card payments, now there is only one integrated report for all Copies Direct requests irrespective of which section supplied the material. At the end of the month a second report is run to create a file of data. This data includes a listing of items supplied to each library and charges. The file is then loaded to the National Library's financial system, which prints the invoices. It has significantly shortened the time of processing payment from days to minutes.

Diagram 3 shows the difference between pre and post automation payment management workflows.

⁶ FTE – full time equivalent approximately 7.5 hours of work per day.

Diagram 3: Payment Management Pre & After Automation



Enquiries

Automation has made responding to enquiries about ILL requests much easier and more efficient. In the past, when a library or individual made an inquiry about one of their requests, for example to ask for a status report or cancel the request, it was very difficult. Firstly the staff member would need to establish when the request was sent, the requesting method as well as gathering information about the requester. Then depending on this information different procedures were required to locate the request. For requests sent via an online system it was possible to determine that the request was received and it was possible to cancel the request. but any of the in-between activities were untraceable. For email or fax requests it was even more complex so inevitably the requester would be asked to resend the request. If the enquiry related to an item that had been supplied the hard copy requests form had to be located to determine the processing history and why a particular action was taken. It was very time-consuming and difficult. Cancelling a request from a library that did not use an online system was virtually impossible and involved staff searching a number of different locations to try and find the request.

Now, the Relais audit trail displays each action taken for a particular request. This includes any communication with the user or supplier entered by the staff member as a note. All of the information is in one spot, which means the information is at the staff member's finger

tips, only one click away. This change has shortened the response time for enquiries significantly and the staff effort required. Relais is also very flexible so it is possible to tailor the messages sent to both libraries and users to explain why material may not be supplied from the National Library's Collections. The information in the audit trail has allowed the Library to discontinue using control sheets to monitor Copies Direct and Urgent requests.

Statistics

Monthly statistics are collected on most ILL/DD activities in the Document Supply Service for corporate reporting. In addition several surveys are run throughout the year to evaluate performance of the section. These include the Processing Time survey, run four times a year and the country of origin, state of origin and library of origin surveys run annually to collect information on the usage of ILL/DD services based on geographic locations and type of library. Ad hoc surveys were also conducted at different times throughout the year to report on collection usage and reasons for non-supply.

Before automation the collection of the monthly statistics was predominantly manual. Every day staff would count requests received, then for each stage of the ILL/DD process data was collected for example number of items sent via Ariel, mail, email etc, or number of items sent on loan, loans and copies. Statistics were collected on a daily basis by many staff members, collated manually and then entered on spreadsheets.

The processing time survey was usually run for one week each quarter and statistics collection sheets were kept at each service point. Staff were required to record information as the request was processed. This process depended on each staff member remembering to record their work. The process was time-consuming and not necessarily very accurate. For any other surveys the data was collected manually by keeping copies of requests and entering the data into spreadsheets. Again very time consuming and labour intensive. Often only data from LADD would be used as a sample survey, as this data could be extracted electronically from the system.

Automation has made a big difference to collecting statistics. A number of reports have been developed to gather this information automatically. These reports are able to extract relevant data from the Relais database and run queries at any time as required. No more hard copy statistics collection sheets, no more manual collecting and collating and no more manual surveys are required. To take one example, the Processing Time survey used to require all staff members to record statistics for one week at a time four times a year. Now staff involvement is not required at all. A report is can be generated at any time to determine the turnaround time for all ILL/DD requests. The ability to use reports to gather statistics has resulted in significant savings of staff time and achieved a much more accurate picture of the Library's interlibrary loan activities.

Request administration

In terms of general request administration Relais has presented many opportunities to eliminate double handling and streamline processes, including managing overdue interlibrary loans. Prior to automation overdue notices were generated only from Voyager. Whilst LADD is able to assign overdue status to requests this functionality is only available to participants. Relais is able to produces overdue notices and sent them automatically to

libraries and users via email as soon as the loan reaches the due date, which expedites the process more efficiently.

Overall automation has significantly reduced double handling of requests and streamlined and simplified most of the workflows significantly. Instead of updating multiple systems, there is a single workflow for most requests and the system automatically calculates the applicable fee and charges. It has also simplified the training program. As there is only one main workflow; there is no longer a need to learn different systems or calculate charges for each request. Staff are able to use Relais to manage the entire ILL/DD life cycle from receiving the request to sending the document. For libraries that do not belong to OCLC or LADD but have an automated system that interoperates with Relais, it has reduced their need to make enquiries as they are able to check the current status of their requests via the Web interface.

Costing

It is too soon to conduct a full cost benefit analysis on the Relais implementation as it has only been in full production for less than 4 months. Nevertheless the workflow improvements should reduce the overall running costs to support ILL/DD and allow the section to undertake additional activities. It is proposed to undertake a cost analysis on the effectiveness of automation after the first year of operation. In order to conduct a full costing, changes in ILL/DD trends would also need to be taken into account.

It should be noted that over the last three years the Library has observed a shift in the material requested. There has been a sharp drop in the number of articles requested whilst loans have remained fairly static. More research is needed to determine the causes for this change however it is likely to be partially associated with the increasing availability of material in electronic form and/or available through the internet. In general requests for material from the Library are declining, on average 11% per annum however the items requested are often more complex than in previous years. All of these factor will need to be consider as part of the evaluation.

The Copies Direct Services in the mean time has been increasing slowly. However the supply rate is currently on average 63%. This is due primarily to users not understanding copyright and asking for the impossible, for example, a photocopy of an entire 2007 publication. Responding to these requests is time consuming and difficult, explaining the Copyright Act for Music material is always a challenge particularly in a global environment with different international copyright regulations. The evaluation will no doubt prove challenging.

Turnaround time

What is certainly easier to measure is turnaround time. Since the implementation of Relais it has been possible to improve turnaround time. Currently the library is able to supply materials within 2 working days for the majority of requests which is better than the four day taken prior to implementation. It should be noted that a maximum of 4 days for core requests is stipulated by the ILRS Code. The majority of urgent requests are supplied on the same day and those received late in the afternoon may be supplied the following day.

Lessons learnt

What did we learn? Plan the automation project with care and double the time initially planned because there will inevitably be delays. Be prepared to change priorities and focus on results. An effective communication plan is essential, however be prepared for the implementation not to go smoothly, and celebrate milestones as the project proceeds. Even small steps eventually lead to the end of the journey, and it keeps the project going in the right direction. Moving the project to production does not end the work involved. There are two areas that need to be addressed at this point, firstly solving any system problems that originate and they will. ILL/DD interoperability with ISO ILL complaint systems is complex. Secondly be prepared to refine the new workflows, because despite careful planning and staff involvement unforeseen issues occur and as time passes staff will develop even better more efficient processes. And most importantly listen to staff questions, concerns and address them. Highlight the benefits and seek to address the problems.

What is still left to do?

There are a number of areas still to be addressed. Firstly interoperation with OCLC due in September/October will see close to 100% of requests processed through the Relais system. The Library receives about 10% of requests from OCLC libraries. This final phase of the project will further simplify workflows and reduce double handling of this final group of requests. Secondly we intend to review our team structure and the composition of our staff profile once the workflows have been bedded down. The workflows so far suggest bringing all staff involved with outward requesting together in a unit and organizing all staff involved with supply in a separate unit. And thirdly, the Relais system itself will be reviewed to determine the most effective use of the system. The implementation was undertaken to automate processes not workflows, however there is much more that the system is able to deliver, therefore a review of the configuration is planned for early 2008.

Conclusion

The ILL benchmarking study identified automation and reviewing workflows as key factors in maximising performance for ILL/DD units. The National Library's Document Supply Service automation project has certainly improved the workflows with Relais now managing the entire ILL/DD process. It has reduced training and documentation requirements and simplified both significantly. Statistics and financial reports are now automated reducing the workload and errors previously encountered. Overall automation has reduced the complexity of the work undertaken by staff in Document Supply and perhaps it is best to give them the last word...

"Relais is terrific – when a library or user rings we just type in the request number and there is the request. You can find out exactly where it is... Before we would spend days looking for just one request!"

"Since Relais our workflows have been streamlined"

"Monitoring outstanding requests is just one report... previously we ran 3 reports and updated 3 control sheets!"

"Being able to resend a document without rescanning is just so easy"

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