Streamlining interlibrary loan and document delivery workflows: tools, techniques, and outcomes

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Abstract

Purpose – This paper aims to describe a review of interlending and document delivery work processes at the National Library of Australia, the purpose of which was to develop a new integrated approach to interlending and document delivery services and to improve turnaround times for users by reducing administrative functions and improving request management processes.

Design/methodology/approach – This paper provides a brief overview of business process modeling notation (BPMN) and its use in the National Library to evaluate workflows, reports on implementation of the project’s recommendations, and highlights lessons learned.

Findings – Good communication and teamwork were critical to the project’s success. Use of the BPMN enabled stakeholders to retain objectivity when evaluating existing workflows. The new workflows and processes resulted in demonstrably greater customer satisfaction.

Originality/value – Discussions of Relais ILL customization to streamline workflows and facilitate e-commerce are especially useful. The paper describes library application of both BPMN and Prince 2 project management methodology.

Keywords Australia, Workflow analysis, Interlending, Process improvement, Relais, Document delivery, National libraries

Paper type Case study

In 2009, the National Library undertook a thorough review of interlibrary loan (ILL) and document delivery (DD) workflows across the whole library, using business process modeling notation (BPMN) to identify areas for improvement. The purpose of the review was to develop a new integrated approach, offering improved turnaround times for users by reducing administrative functions and improving request management processes. This resulted in a comprehensive report containing more than 70 recommendations. In December 2009 the Library commenced a project to implement these recommendations.

Background

In April 2009, the National Library of Australia began the Reproduction Services Project to review ILL and DD workflows throughout the Library and identify improvements. Six different work units across the Library provide ILL and DD services to users and library users based on the material format of the requested item, e.g., printed materials, oral history, manuscripts, or pictures.

The National Library commenced automation of its document supply services in 2002 when the first web-based Copies Direct request forms were made available to the public. This allowed users to search the catalogue, identify items they would like copied, and submit requests which were then e-mailed to the appropriate work unit for supply. The Library purchased the Relais ILL management system in 2005, further streamlining internal workflows. By 2009 approximately 90 percent of requests were managed through Relais, including requests received directly from users through Copies Direct and requests received from libraries via the National Library’s web-based ILL order form, Libraries Australia Document Delivery, and OCLC. All electronic requests are transferred into Relais for processing. Because Copies Direct did not support the option of requesting multiple items, users wishing to order multiple items completed a paper form; these requests were handled manually and resulted in complex workflows.

The Reproduction Services Project used BPMN[1] to identify areas of overlap and workflow improvements. BPMN is a standard for describing and modeling business processes and uses a graphical notation for specifying processes in a business process diagram[2]. The graphical notations are also described in a narrative which documents the processes and

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different activities in the form of a story, so that both technical and operational stakeholder groups can easily understand complex processes[3]. Staff members in the various work units were interviewed; diagrams and narratives were prepared, analyzed and reviewed to ensure they accurately described the workflows. In total 11 BPMN diagrams and narratives were prepared and analyzed for the different work units and all of this information including recommendations for changed approaches was incorporated in the Streamlining Collection Reproduction Services Workflows Report.

The first phase of the project identified five major areas for further work:

1 Redevelopment of the Copies Direct service to incorporate two major improvements: the addition of a shopping cart to enable users to request multiple items in a single order and credit card validation.
2 Improvements to Relais to support the new workflows, such as support for the shopping cart facility, and to enable us to use Relais to manage the entire request flow from receipt through internal processing and, finally, to delivery to the user.
3 Workflow changes to streamline the routing of requests through Relais to other units for preservation or digitization work.
4 Development and review of policies to support the new workflows and ensure consistency between the different work units.
5 Explore interoperability between the Library’s integrated library management system and its ILL/DD management system for loans.

Phase 2 of the project

The Library uses the Prince 2[4] project management methodology to manage projects. This methodology uses structured reporting mechanisms and standard report templates for project boards and steering committees. In the first phase of the Project the team structure consisted of:

- the project manager, who managed the project, collected data, and prepared the report;
- the director collection delivery and storage, who manages the Document Supply Services team and who assisted the project manager with report preparation;
- a business analyst, who would later prepare the technical specifications for redevelopment of Copies Direct; a project board to oversee the project; and
- stakeholders representing the different ILL and document delivery work units.

In Phase 2, which commenced in December 2009, three new groups were added: a steering committee, which met fortnightly to discuss progress; the application developers; and the Relais infrastructure support team, which implemented changes to Relais. Fortnightly stakeholder meetings were established so that all work units providing copying services could deliver feedback on system requirements and developments.

Copies Direct redevelopment

The Copies Direct[5] service, which allows end users to request copies of items in the Library’s collections or to request items on interlibrary loan, is accessible from the Library’s catalogue, Digital Collections, Trove[6] (an online search service providing access to Australian material), and Libraries Australia.

Phase 1 of the Project identified the need to redevelop Copies Direct to meet user expectations, in particular the development of a shopping cart function and the addition of credit card validation.

In Phase 2, all of the requirements, issues, and problems identified through consultation with stakeholders in Phase 1 were incorporated into a set of requirements and specifications for the redevelopment of Copies Direct. The specifications were then used by the Application Developers to build the new service. As features were developed, stakeholders were given an opportunity to comment and suggest improvements through regular fortnightly meetings. Issues identified by the Developers could be discussed at these meetings and the specifications subsequently amended. Chocolates in all different flavors and sizes were one of the most welcome aspects of these meetings, creating an amiable environment and helping the team work well together.

Requirements included the development of shopping cart facilities, better data collection, more targeted help, incorporating copyright information from the Library’s copyright status calculator tool, and exploring e-commerce solutions.

The shopping cart facility was developed to overcome the requirement for manual request forms from those users wishing to order multiple items, which had been a limitation of the original Copies Direct service. This service was particularly important for picture orders because users often wish to request several images at the one time. The new shopping cart facility was designed to allow users to place multiple items in the cart from different systems. It not only allows them to place items in the cart from the Library catalogue, but also to include items from Libraries Australia, Trove, and the Digital Collections in the same cart. This gives users a more flexible service.

Although the technical aspects of developing the cart were straightforward, ensuring the facility was capable of handling different access conditions for different formats in the same cart required careful consideration. Under the Australian Copyright Act 1968 (Commonwealth of Australia, 1968), copyright in unpublished material does not expire. Therefore, in order to simplify ordering the system was developed to provide the user with the option of selecting the “same use” for all items in the cart which allows the user to complete one declaration for all items in the cart or, alternatively, to complete a separate declaration of use for each request in the cart. In a mixed cart, the latter option is automatically presented if any of the items has access restrictions.

The new service, which uses customized screens to capture more accurate information relating to specific collection formats, assists in processing the order. This allows format-specific help text to be provided where required and enables the system to list only output products relating to that specific format. For example, if a user is requesting pictures, the system only offers image outputs in either digital or print formats but it does not offer a photocopy option; likewise, for oral history material, it offers sound files or transcript copy options, but not images.

Copies Direct was conceived as an ordering service for end users; however, as part of the redevelopment, it was
Recognized that efficiencies could be gained if internal users also used the service. Internal users are Library staff members who require copies from the collection for official purposes, such as images for a Library publication or an exhibition. In addition to the usual bibliographic and item level information required to fill the request, internal users also need to provide additional information and of course there is no charge for these requests. These requirements were also included in the Copies Direct redevelopment; to access the service, internal users log in using their staff library card number.

One issue identified in the first phase of the Project was the amount of time staff members spend assessing copyright or permission issues. As a result, it was agreed to incorporate copyright information from the Library's copyright status calculator tool[7], which reports the copyright status of the item into the request. This helps staff members determine whether the material is in copyright and assists in making decisions about copying options. The National Library of Australia's Copyright Status Tool uses information in catalogue records to provide an estimate of copyright status and is therefore only indicative.

**E-commerce**

The number of Copies Direct requests has increased from fewer than 2,000 in 2002 to more than 17,000 in 2010 due to the increased exposure of National Library catalogue records on WorldCat and Google. This increase in demand also resulted in an increase in financial transaction complexities; therefore, it was agreed to investigate options for streamlining credit card payments. The team first looked at credit card validation as a solution; however, it became evident that further workflow improvements could be made by incorporating an electronic payment system. In December 2010 the Library issued a request for quotation (RFQ) for e-payment services to support Copies Direct. Tenders were evaluated based on their ability to meet specified requirements, including the abilities to: validate credit cards by placing a “preauthorisation” hold for a small amount; generate a billing token for credit cards so the Library would not need to store credit card information; refund the user when an incorrect charge had been placed; and send a bulk of transactions to the payment gateway for processing. Based on these requirements, the Library selected E-WAY as the successful tenderer.

In order to get all of the systems to work, the Library established a merchant account with the bank, developed interfaces to interact with the payment gateway, and created reports necessary to manage the service.

**Relais improvements**

A review of the Relais system identified a number of issues which needed to be addressed to complement the Copies Direct redevelopment. It is important to acknowledge that without support from Relais International, the redevelopment of the Copies Direct service would not have been possible.

Concurrent with the Copies Direct redevelopment, another team in the Library was busy upgrading our Relais ILL management system to the latest version, V2010, which incorporated a number of new features such as support for “parent” and “child” requests (i.e., multiple requests for portions of the same bibliographic item). This feature, whilst useful for manuscript requests, was seen to have limited application at the Library. However, if the application were to be enhanced, it could support a shopping cart function. In addition, a number of fields in the request form needed to be enlarged and several new fields were required. These changes were identified and reported to Relais International, creator and developer of the Relais ILL management system. Hereafter, I will use Relais International when referring to the company and Relais when referring to the product.

Relais International and the National Library agreed to undertake enhancements to the Relais system to support the new Copies Direct developments. This development work was commissioned by the Library and Relais International and created the specifications and developed the solutions.

The parent/child request, a service designed to handle multiple requests from a manuscript collection, was enhanced to support the shopping cart. As part of the enhancement, Relais developed a new type of request for the cart, a request “B” which is very basic and does not follow the usual request flow path in the system. Instead, it goes directly to the completed status and includes only the Copies Direct shopping cart number and some delivery information.

Changes to the Relais interface were also required to support the shopping cart function. The parent/child feature delivered as part of V2010 includes a “parent” record describing the bibliographic detail of the manuscript and one or more “child” requests listing the pages, sections, and/or items from the manuscript collection the user wants copied. However this did not work well for the shopping cart because each child request is complete in its own right. Once again Relais International agreed to modify the interface to enable these shopping cart requests to display all of the fields, thereby making it possible to search and find the shopping cart and all requests in the cart. It is also possible to edit individual requests and modify information as needed.

The new shopping cart request type then needed to be incorporated, along with the other field changes, into the Relais XML service so that requests initiated through the Copies Direct request form could be transferred into Relais for processing. Relais International undertook development work to increase the size of some database fields and make all necessary changes to their XML service, which Copies Direct uses to transfer requests into the Relais ILL management system.

Another new feature in Relais is a “Patron communication” process, which enables the Library to pre-configure standard messages and then send them to the user and allows the user to respond to the message in Relais. For example, the Library can send a pre-configured message such as a cost quote to the user and require a yes/no response from the user. The user receives an e-mail with a link through which they can respond to the quote. In Relais, the request is moved into a Review Queue to await the user’s response. When the user responds the request is automatically moved to another queue alerting staff to the change in status. If the user does not want the copy the request is automatically cancelled. This function also includes the ability to attach a document such as copyright permission, although as of this writing the new file still needs to be attached manually to the request after it is uploaded to the Relais Memo directory.

Internal users sometimes need to attach a file at the request ordering stage in Copies Direct. For example, they have
photocopied a page in a book or downloaded an image, then manually selected a portion of the work for photography. It is often much easier to convey instructions by taking a photograph of a photocopy, annotated with notes and lines around the item to be copied, than to write complex instructions. Therefore it was essential that the new Copies Direct service allow these users to attach a document. In the new service, internal users login, attach a file to the request, and complete their ordering processes. The request is then transmitted to Relais. In Relais, the request goes through the usual processes and is automatically placed in the “Patron Responded Review Queue” so staff can attach the file and forward it to the appropriate work unit for processing. Relais has added the ability to view the request, view the document or view the attachment (memo). When staff members retrieve the material to be copied they can also print a copy of the attachment, which they can then take to the relevant work unit for digitization.

Yet another useful Relais enhancement relates to charges. In December 2010 a pricing review identified the need to increase charges for ILL and DD requests. The implementation of these new charges was an excellent opportunity to streamline some of the supplying options in Relais and enable the system to calculate fees based on the user’s preferred output format, such as photocopy/scan PDF, photocopy/scan printed, MP3 file (oral history), Tiff, Tiff on CD, Jpeg etc. Charges were then defined for each format so that when the material is supplied Relais calculates the correct charges and reports them on the cover page sent to the user.

New pick lists and cover pages were designed to incorporate all the changes made to Copies Direct and Relais. These changes have made it easier for staff to determine what the user needs, any copyright or restriction associated with the material, and which output formats they require. Relais then uses the information to apply the necessary charges.

Workflow improvements

A number of changes were made in addition to the development work outlined above. For some requests, specialist services are required before the material can be supplied. One example is preservation services, where it may be necessary to de-frame a picture before it can be photographed. Previously staff would fill out paperwork and take the material to the Preservation unit. Preservation would treat the material and advise the Pictures unit to collect the material. Pictures unit staff would then update the paperwork before taking it to the Digitization and Photography unit. Since the bulk of the copying workflow was already handled by Relais, it was agreed to investigate the feasibility of diverting these requests to other work units before supplying to the user, to assist with tracking movement.

Relais International developed a workflow sub-process to handle these types of requests. When the sub-process is activated, an e-mail or printed pick list is sent to the relevant work unit for action. The work unit then undertakes the work and, when it is finished, they update the request in Relais to indicate completion. A new pick list is printed back at the supplying unit to alert them to collect the material and that the copy is ready to be supplied to the user. This change has enabled the Library to create a single workflow covering all aspects of supplying material to the user.

The Library identified four areas where this sub-process would assist: requests for music material, which usually has complex copyright; requests for rare and valuable collection material; requests for material requiring Preservation treatment; and requests requiring Digitization and Photography services. The music sub-process enables document supply service staff to send an e-mail to the Music unit for specialist advice about copying music. Similarly, the collection managers’ sub-process enables document supply staff to send an e-mail to the collection managers for advice on copying older material. In some cases, the material requires preservation treatment before it can be copied; in other cases, the collection manager determines the material should be digitized in its entirety even if the user only requires a small part - this is particularly relevant for out of copyright Australian publications. In some cases collection managers may advise the material is too fragile to copy.

The preservation sub-process is a little different in that it enables all work units in the Library to forward requests for preservation treatment. Staff members take the material to Preservation Services and update Relais. This action sends an e-mail to Preservation with all of the request details and treatment options listed. Staff members in Preservation can copy and paste information from this e-mail to their database and use the printed e-mail to record any treatment of the material.

A further variation is the digitization and photography sub-process which enables all work units to forward requests for digitization to the Digitization and Photography unit. Staff members take the material to the unit and update Relais. This action prints a specially designed pick list which the photographers use to record information on the shots they take to digitize the material.

There were several other workflow changes made as part of this project. The majority of workflow processes in Relais were set up as part of the initial implementation in 2005. Few changes were made to the internal workflows in the Relais system except to enable interoperability with Libraries Australia Document Delivery in 2007 and OCLC in 2008 via the ISO 10160/10161 ILL protocol. As part of this Project, these workflows were examined and changes made to eliminate some duplicate handling and simplify complexities that had developed over time.

A new workflow

Changes were made progressively to Relais leading up to the launch of the new Copies Direct on 12 July 2011. Feedback received so far has been very positive from both users and staff.

So what’s the new workflow?

Users can search the National Library’s catalogue or Trove or Libraries Australia, find the item they want copied from the Library’s collection, and add it to their shopping cart. Once they have added all the items they want copied to the cart, they can complete the order by adding the output formats and delivery time required, adding a declaration of use to help staff determine whether the material can be supplied, and finally, adding their payment information which is securely validated with the e-payment provider. Internal users are also able to attach a document to any request in their shopping
cart. Then the requests are submitted to Relais, where they are automatically searched against the catalogue to determine where they should be routed in the building. Any requests that do not match are sent to a review queue for staff to action. Requests automatically print in the different work units for processing. The new developments in Relais now permit staff to forward a copy of the request to another unit for copyright evaluation or copying review and for that unit to respond in Relais. There is also a sub-process to send a request to the Digitization and Photography unit for specialist digitization or to the Preservation Services unit for treatment, and for these units to respond once their task is complete. These sub-processes enable staff to track the request through its entire life cycle and document any issue or action within the system. After the item has been copied, it is usually delivered electronically through Relais. When the material is processed, the user is charged for the supply of the material via the e-payment gateway. Now it is possible to query Relais and determine the precise status of any request wherever it may be in the Library and have immediate access to information relating to decisions made throughout the processes.

This workflow enables close monitoring of requests so that if delays occur it is possible to quickly determine the causes and communicate with the user through Relais.

What’s left to do?

While there have been significant improvements to workflows as a result of this Project, there are still a number of tasks that will add further efficiencies.

In the next stage of the Project the Library will investigate interoperability between Voyager and Relais for circulation data. The team will consider options including the Voyager InterCirc software and the eXtensible Catalog’s (XC) NCIP Toolkit. Both options appear to offer similar functionality but further investigation is required. However, it is important to ensure both Voyager and Relais are able to exchange circulation data as staff currently check out loans in both systems, with the inevitable inefficiencies associated with double handling and consequences such as checking out on one system but not the other. This can lead to claiming overdue items where the material has already been returned, or not completing requests in Relais, leading to additional double handling and consequences such as checking out on one system but not the other. This can lead to claiming overdue items where the material has already been returned, or not completing requests in Relais, leading to additional work to correct these omissions.

The Library will also be reviewing procedures manuals and policies to ensure greater consistency between work units and will continue to review workflows.

Lessons learned

This was a very complex project with many interrelated developments and changes occurring in different timeframes. Keeping the project going was interesting at times. However, it is fair to say that this project would not have been possible without the good will, humor, and concerted efforts of all project stakeholders. And although in the end implementation was delayed by about three months, everyone was very pleased with the outcome.

Here are some of the lessons learned

In the initial estimates, the time required to complete the project was underestimated. We also underestimated the time required for the tender negotiations and the time required for the Relais upgrade. There are a number of issues that can impact timeframes and many were outside the project manager’s control. However, good communication and making incremental progress on resolving issues will keep the project advancing. The most important aspect to this issue is keeping the project board and all stakeholders up to date on developments, issues and slippages.

Good teamwork is essential and, with such diverse teams, good communication was important. The team structure worked well. In essence there were three main teams: the application developers, the Document Supply Services team, and the Systems Infrastructure Group. Each brought different expertise and knowledge. Each meeting was recorded and information was shared on a wiki, in files, etc. Reports and issues papers were prepared for board meetings to ensure issues and decisions were clearly documented. Meetings were set up in advance to enable participants to plan ahead and, if they could not attend, to send a representative.

I cannot overemphasize the importance of good communication. All stakeholders commented repeatedly on how well the project was managed; however, it was the regular meetings, the willingness of the team to meet with select work units to tease out specific issues, and frequent sharing of information that enabled the project to advance relatively smoothly. Although, personally I think it was the chocolates. It was such a simple thing but it made meetings fun, it broke the ice as people passed their favorite chocolate around, and it gave people a chance to connect on a personal level, so when it came time to making decisions there was a willingness to think about the collective impact rather than consider the issue from one view point only.

Using BPMN to document workflows allowed all parties to objectively examine workflows. With the diagram and narrative describing the processes, it was easy for everyone to see where there was duplication of effort, unnecessary complexity, or multiple people undertaking the same task. This enabled all staff to step back from what they do on a daily basis and look at their workflows objectively. My role was to record their processes and ask why, not to challenge but to clarify, to see if there was another simpler way of doing things. By working together we could identify solutions, which made it much easier to implement change as staff could see the benefits before changes were implemented.

Conclusion

A project of this size and scope is not the work of one person or team. It is only by working together with the project teams, project board, steering committees, and stakeholders that we can develop products and services to meet the needs of our users. This project is complex and, although not quite complete, it is already reaping benefits. The new workflows are settling down, the orders are coming in, and the users are happy:Once again a sensational response to my request. Informative, helpful and absolutely meeting my needs. Your Librarians are the best. Thank you! Same goes for the ease and efficiency of the copies direct service. This is the third time I have used it – it’s great – especially when time and distance are both limiting factors. Again thanks[8].This quote from one of our users is typical of the type of response our Copies Direct service is receiving, and for the Library, this is...
the ultimate reward. However, we cannot rest on our laurels. There is still much to do, documentation to complete, policies to review, and workflows to re-visit in six months or so.

Notes

1 See Business Process Modeling Notation home page, available at: www.bpmn.org/
3 For more information on the National Library of Australia’s use of BPMN in this project, see conferences.alia.org.au/access2010/pdf/Paper_Fri_1140_Margarita_Moreno.pdf
4 “PRINCE2 is a process-based approach for project management, providing an easily tailored and scalable project management methodology for the management of all types of projects – www.prince2.com
5 For more information on the Copies Direct Service, see https://copiesdirect.nla.gov.au/
6 Trove is a search service provided by the National Library to find Australian and online resources – trove.nla.gov.au/
7 For more information on the National Library’s Copyright calculator tool, see https://wiki.nla.gov.au/pages/viewpage.action?pageId=22741548
8 Quote received from a user of the new Copies Direct service on August 9, 2011.

References


About the author

Margarita Moreno is Manager of the Document Supply Service at the National Library of Australia. For the past two years she has been working on a new project to review interlibrary loan and document supply workflows, streamline processing, and eliminate inefficiencies. She has been at the National Library for many years and held a number of different positions. In July 1999 she moved to the Document Supply Service section, where she has participated in a number of projects such as the Interlibrary Loans Benchmarking Study and development of the Interlibrary Resource Sharing Code. Margarita has published numerous articles on interlibrary loan and document delivery services and presented papers at national and international conferences. She is a member of the IFLA Document Delivery and Resource Sharing Standing Committee, the ALIA Interlibrary Loan Advisory Committee, and the Shares Executive Group. Margarita Moreno can be contacted at: mmoreno@nla.gov.au

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