# Calming the Tempest:
# The Benefits of Using Prospero
# for Electronic Document Delivery
# in a Large Academic Library

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ABSTRACT. To effectively supplement a library's collection, Interlibrary Loan departments must strive to produce materials quickly. As libraries acquire more online databases, ILL departments experience a reciprocal increase in article requests submitted. Facing increased demands, how can ILL departments improve and maintain timely and efficient service? The Information Resource and Retrieval Center at the University of Illinois at Urbana-Champaign responded to this challenge by integrating Electronic Document Delivery to the benefit of library users. This article describes University of Illinois at Urbana-Champaign's decision to use Prospero for EDD and the trials and triumphs of Prospero's successful implementation. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <getinfo@haworthpressinc.com> Website: <http://www.HaworthPress.com> © 2002 by The Haworth Press, Inc. All rights reserved.]

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## INTRODUCTION

"I needed this article yesterday!"

While Interlibrary Loan departments cannot calm the tempest and turn back the hands of time, some institutions have attempted to shorten the elapsed time between the patron's initial request and the receipt of the item. Technology has already improved Interlibrary Loan delivery with facsimile machines and electronic delivery through Ariel.[1] More sophisticated than the facsimile machine, Ariel enables the scanning and transmitting of articles across the Internet from library to library. Advantages of Ariel include the "ability to forward without losing quality" and to simultaneously send and receive photocopies.[2] Now, Ariel is becoming the foundation for end user, desktop document delivery with software like Prospero.[3] The University of Illinois at Urbana-Champaign (UIUC) tackled the issue of calming the tempest of incoming Ariel files by implementing Prospero in February 2000.

## ANALYSIS OF WORKFLOW

Responding to the increased use of interlibrary loan and document delivery services and high user expectations for timely delivery, the Information Resource and Retrieval Center (IRRC) at University of Illinois at Urbana-Champaign began searching for ways to reduce the time elapsed between an initiated request and the patron's receipt of the material. An informal study of the Borrowing Office workflow showed that deliveries of articles were taking an average of 4 business days, after the Borrowing Office staff requested the material. Additional time was required for processing once the material arrived at the Interlibrary Borrowing Office.

University of Illinois at Urbana-Champaign confirmed that delivery methods were adding unnecessary time to the total process. Prior to electronic delivery, all articles received at University of Illinois at Urbana-Champaign, whether through traditional U.S. mail or Ariel, were mailed to patrons at campus, local, or non-local addresses. Although an article

> **Borrowing Office Workflow before Prospero**
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> ♦ The Article sent to the Ariel queue at UIUC,
> ♦ printed,
> ♦ Checked for accuracy, and
> ♦ placed in a bin, waiting for student assistants.
> ♦ Students update materials as received.
> ♦ Mailing labels are printed, and
>    articles are sent to the patron.
> ♦ Patron receives the article.

was delivered to the library via Ariel, the patron would still wait for the article to be printed, checked for quality, updated as received in OCLC and the Borrowing Office database, addressed for mailing, and then sent to the mailroom. Once an article was received in the Borrowing Office, a patron may not have the material for another week!

Statistics showed that approximately 90% of "photocopied" requests were supplied via Ariel. Since most articles were already in electronic format, the IRRC decided to implement a method of Electronic Document Delivery (EDD). By using EDD an article can be checked for accuracy and immediately placed on the web server for the library user, cutting delivery time significantly. A logical sequence to the workflow included an immediate update of the local database and OCLC, resulting in much more accurate "received" dates. Previously, this last step was delayed until just before mailing the photocopies.

The new workflow was experimental in nature, so University of Illinois at Urbana-Champaign used Prospero, an open-source software.[4] Prospero is an EDD service created by the John A. Prior Health Sciences Library at Ohio State University, which "[reduces] Ariel production costs and the time it takes to receive documents."[5] Prospero allows library users to collect their photocopy requests in a Portable Document Format (PDF) format on the Internet. Since Prospero is freeware and installation time was minimal, the IRRC chose it for the new EDD process. Additionally, because Prospero is open source software, modifications can be made as seen fit by the department. For example, the authentication method could have been changed to one commonly used on campus. After the University of Illinois at Urbana-Champaign Library Systems Office installed Prospero, a new workflow was established specifically for photocopies delivered electronically to the Borrowing Office via Ariel.

## PROSPERO IN ACTION

Initially, IRRC faculty librarians, staff, and graduate assistants were trained on the new process to work out difficulties with the procedures and instructions. The process was continually revised during the first month until everyone felt comfortable with the new workflow, which included using the Prospero software. At this point, student assistants were selected according to their scheduled hours and trained to process incoming documents on Ariel by using Prospero.

University of Illinois at Urbana-Champaign was able to drastically cut delivery time for photocopies. Now, instead of printing articles and setting them aside to be checked for accuracy, the articles are checked in Ariel for quality and automati-

> **Borrowing Office Workflow after Prospero**
> ♦ Articles are sent to the Ariel queue at UIUC.
> ♦ Checked for accuracy, and
> ♦ Placed on the IRRC Web Server.
> ♦ Patrons receive notification that their article is available on the Web Server.

cally placed on the IRRC web server. At the same time, library users receive email alerting them that they have a new document. The Borrowing Office keeps a log of ILL numbers, lending symbols, and requester's names to update materials as received after they have been delivered to the user. Because photocopies are sent through Prospero, the requester does not wait for student workers to print mailing labels or for the photocopies to travel through the mail. Likewise, student worker time previously spent preparing photocopies for the mail is spent more effectively on other aspects of Interlibrary Borrowing.

The results of using Prospero for EDD were obvious within the first week. Library user feedback was enthusiastic and included requests that all of their photocopied materials be delivered electronically. One satisfied user responded by email, "I just rec'd my first document/article from IRRC electronically and let me just say–wow! All worked perfectly!!! What a great service. Thank you. [Signed (student's name)] Appreciative Grad Student."[6]

Approximately 20 library users requested that their materials not be delivered electronically. Library users who did not want electronic delivery of articles expressed a lack of desire to learn more computer-related technology, no need for quick turnaround time, and preference for delivery of a hard copy to home or campus.

The Borrowing Office reduced its use of paper by approximately 144,000 pages, or 288 reams annually, with a savings of $830. Additionally, once workers were fully trained on using Ariel and Prospero, time spent processing each piece was reduced and backlogs of material waiting to be mailed out were eliminated. More accurate statistics for the time taken to fill a request were kept with the elimination of delayed updating to the local database.

## TROUBLESHOOTING

Two primary problems emerged in using EDD. The first problem is access difficulty on the part of the user, and the second problem covers processing errors by staff and student workers.

Solving access problems is an ongoing process since library users' range of computer knowledge varies widely. First time EDD users call or stop by the Borrowing Office asking for help and advice to access their documents. A frustrated faculty member stopped by the IRRC because she was unable to view the documents from her office computer. In order to serve the faculty member's needs, the document was printed and delivered on the spot. Encouraged, she wanted to know how to access her documents from her office workstation. After a brief discussion, staff determined that the faculty member had an older version of Adobe Acrobat Reader. After installing Adobe's Acrobat Version 4.06 on her computer, the faculty member called the Borrowing Office and was elated that she had just accessed and viewed her first EDD article.

The most common problem at University of Illinois at Urbana-Champaign is users who may not have the most recent version of Adobe's Acrobat installed on their computer. Installing Adobe's Acrobat version 4.06 solves numerous problems related to access issues. Additional problems arise due to large files and older computers.

In order to decrease user frustration, the IRRC created a web page of Frequently Asked Questions about using Electronic Document Delivery and added a hyperlink to the EDD login page for easy cross reference.[7] Other institutions, such as the University of Michigan[8] and the University of Arkansas,[9] have created an on-line Troubleshooting Guide using Prospero for EDD as well. Knowing and anticipating the needs of clientele is an important part of making the introduction of EDD successful. Creating options for users to solve problems on their own has been helpful.

The second involves catching errors made by staff and student workers when sending users the document alert email. To prevent email address input errors from going unnoticed, notifications not received are bounced to the IRRC departmental account. These messages are printed off and compared with the processing log to determine which documents are inaccessible because of errors during the initial input of an email address. For example, the email <jdoe@UIUC.eud> will generate a bounced email report to the IRRC. By logging into the EDD page with J. Doe's incorrect email address and PIN number, the document can be printed off and retrieved even though an error has occurred.

## TECHNICAL

The University of Illinois at Urbana-Champaign Library Systems Office has offered support beginning with installation and continuing past the initial troubleshooting required when data files were corrupted. Most problems pointed to fluctuating server disk use with inadequate free space. Prospero writes its data to flat text files using limited error checking, making it highly susceptible to corrupting its own information. For example, it can cause the loss of user information, loss of documents on the system, or the inability to determine to which patron the documents belong. With as many as 700 documents on the web server at one time, a new server with plenty of free space was brought into service. Installing a new server has eliminated corrupted file problems created by inadequate free space on the server. The ongoing cooperation and communication between the Systems Office and the IRRC has allowed the EDD service to continue.

## ADDITIONAL SERVICES

Within a few weeks, EDD became very popular with the majority of the IRRC's users. In fact, the Health Sciences and Veterinary Medicine Libraries on the University of Illinois at Urbana-Champaign campus sought ways to benefit from Prospero. Both departmental libraries were already using Ariel. As a result, the IRRC cooperated to establish a document-forwarding program with these libraries. The goal of both libraries was to deliver photocopied material faster than campus mail.

Each library had specific needs that had to be met. First, the Health Sciences Library is unique, since the library is affiliated with the University of Illinois at Chicago (UIC), but the collection is located at Champaign-Urbana. Another workflow and set of procedures was created to differentiate between regular University of Illinois at Urbana-Champaign patrons and UIC patrons. So, the Health Sciences Library forwards their incoming filled documents to the University of Illinois at Urbana-Champaign Lending Office's Ariel station. This keeps incoming documents received at the Borrowing Office separate from material intended for the Health Sciences Library clientele.

> **Using Prospero to Benefit Department Libraries**
> - Articles are forwarded to the Lending Ariel station and
> - Placed on the Web Server
> - Health Sciences and Veterinary Medicine patrons are sent e-mail notification that their article is available.

Separating the material and sending it to the Lending Office was essential for the Borrowing Office, since the Borrowing staff may receive and process over one hundred documents per day via Ariel. The Health Sciences Library averaged ten items per day, which were quickly processed daily by the Lending staff.

The same procedure is used to assist the Veterinary Medicine Library in delivering materials quickly. Their materials are forwarded to the Lending Office via Ariel and processed by the Lending staff. Currently, the Veterinary Medicine Library offers the only Docline service on campus, which was another reason these users expected quicker delivery. An added benefit for these users is the fact that the Veterinary Medicine Library is located remotely south of the University of Illinois at Urbana-Champaign's main campus and serves constituents located across the University of Illinois at Urbana-Champaign campus. EDD saves these users from making additional trips to south campus and relieves them from waiting on campus mail services for delivery of their material.

## FUTURE

The EDD service has been such an overwhelming success that it is being expanded to cover all articles requested through the IRRC. Plans are underway now to install an additional scanner to handle any hardcopy article sent by a lending library. While some of the IRRC's patrons prefer not to use EDD options at all, the majority have experienced the benefit of receiving documents electronically. Patrons know that by using EDD, materials arrive faster than campus or U.S. mail systems can deliver. Additionally, patron access to articles is not limited by library hours, unfavorable weather conditions, or holiday mail schedules.

## CONCLUSION

Despite initial difficulties designing an efficient workflow, troubleshooting systems related problems, and working through user access issues, University of Illinois at Urbana-Champaign's Information Resource and Retrieval Center is committed to providing timely Electronic Document Delivery to the campus community. User response has favored employing electronic resources to enhance ILL services. After a year of use at University of Illinois at Urbana-Champaign, Prospero has calmed the tempest of incoming Ariel documents by providing a quicker turnaround time and has supported a means for additional document delivery services on campus.

## ENDNOTES

1.  Ariel. Available: http:hwww.rlg.org/ariel/.
2.  The Ariel Advantage. Available: http://www.rlg.org/ariel/ariadv.html.
3.  Prospero. Available: http://bones.med.ohio-state.edu/prospero/.
4.  Eric H. Schnell, "Freeing Ariel: The Prospero Electronic Document Delivery Project," Journal of Interlibrary Loan, Document Delivery & Information Supply 10, (1999): 89-100.
5.  Ibid., 90.
6.  Email correspondence from a University of Illinois at Urbana-Champaign graduate student to Lynn Wiley, head of the IRRC. Email in possession of author Cherié Weible.
7.  University of Illinois Information Resource Retrieval Center (IRRC) Electronic Document Delivery Troubleshooting Guide. Available: http://gateway.library.uiuc.edu/irrc/ eddhelp.htm.
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