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Electronic Document Delivery: A Survey of the Landscape and Horizon

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The authors examine, based on a survey of users, the electronic document delivery methods currently in place as well as changes in the recent past and future developments. Interlibrary loan and document delivery staff were surveyed from institutions across the United States in order to ascertain what document delivery mechanisms are currently in place, how they are being used, and why. Findings from this study should lead to an increased awareness of electronic delivery options in libraries across the country and elucidate the dynamics involved at individual sites. This, in turn, will assist librarians in making decisions, based not only on their individual circumstances, but on the experience and trends found across a broad sampling of institutions.

KEYWORDS Odyssey, Ariel, BScan ILL, Relais Express, RapidX, interlibrary loan, electronic document delivery, scanning

INTRODUCTION

Electronic document delivery has been an important component of interlibrary loan (ILL) operations since the advent of the fax machine. Through the development of software programs such as Ariel, Prospero, ILLiad's Odyssey, and RapidX, electronic document delivery has been further refined to meet the needs of both interlibrary loan staff as well as end users. With the

portability of file formats such as PDF and TIFF, even email is being increasingly used as a low-cost, low-tech method of electronic document delivery which remains system-independent and relatively convenient, especially for average to low volume ILL units. Posting documents to a secure web server for either borrowing institutions or patrons has also become a viable option. The electronic document delivery landscape is always changing, but perhaps never so much as it is now. It is this unprecedented change and the desire to make sense out of it that has been the impetus behind this study.

Following the results of a poll released by Timothy Bowersox highlighting the use of Odyssey's Trusted Sender feature by ILLiad libraries, the authors became interested in how many ILLiad sites are still using Ariel in addition to Odyssey. This interest widened in scope, as there is significant electronic document delivery software crossover between platforms, ILL management systems, and libraries of various size and type. In order to gain the clearest and most comprehensive view of the current environment of electronic document delivery in the United States, a web survey was distributed to subject-specific discussion lists. The findings of this survey have been collected, compiled, analyzed, and represented in such a way as to be useful for disparate ILL operations. The goal of this paper is to examine use of different methods across various institutions and to identify trends that will lead, not only to improvement of interlibrary loan and document delivery, but improvement of the software products themselves.

PRODUCT BACKGROUND

Ariel

Ariel, released in the fall of 1991, was developed by the Research Libraries Group (RLG), formerly a membership-based, not-for-profit organization comprised of research libraries, museums, archives, historical societies and national libraries. RLG is now part of the Online Computer Library Center (OCLC). Limited by the capabilities of fax and postal delivery methods, RLG members wanted to take advantage of their existing Internet connection to send documents inexpensively and rapidly. Members also wanted to improve the quality of transmitted images. Ariel was developed in response to this need. Initially, Ariel was restricted to the DOS environment, but a Windows version was developed in 1994. Since then, Ariel "has grown from a solution for a relatively small group of large research libraries into a de facto international standard for document exchange used by libraries and document suppliers of all sizes and specialties" (Lavigne & Eilts, 2000, p. 7). Ariel delivers documents to other Ariel workstations through FTP or email, and converts them to PDF files for patron delivery. It supports grayscale and color images, and scans and prints on letter, legal, journal, A3 or A4 sizes. By the end of 1998, there were over 4,000 Ariel users around the world, mainly in the United States, but across 18 other countries as well (Ibid., p.5). Infotrieve, a multifaceted document delivery company, purchased Ariel from RLG in 2003 (Shigo 2003). According to the Infotrieve web site, Ariel is currently used by over 9,400 institutions worldwide.

Prospero

Developed by the Prior Health Sciences Library at Ohio State University in Columbus, Prospero was released in 1999 as a free, web-based, open source software that works both with Ariel or as a standalone program. Prospero conveniently converts tagged image file format (TIFF) files into a portable document format (PDF), preserving the layout of the original, scanned document. When Prospero was released, Ariel did not have this feature. TIFF files were only supported. Prospero also provides patron access to scanned documents electronically. Patrons are sent an email notification message that indicates the URL for the available document and assigns a PIN to the account. Once users log into their account, they will see a list of viewable documents. Libraries can set the number of views allowed for a document and establish the length of time it will be available for viewing, giving libraries control over copyright-compliant practices. Prospero also includes a database of patron email addresses, and a log of documents sent and documents remaining on the server. Technical support for Prospero is limited to a Web Board, email list and other web documentation. The latest version, 2.0, was released in 2002, but according to the Interlibrary Loan and Document Delivery (ILL-DD) web board of Open Source Systems for Libraries (oss4lib), version 2.0 is unstable. Instead, version 1.40 is currently available for download. Prospero use may be waning now, not only because of technical issues and the lack of user support, but also because Ariel is now able to convert TIFF files into PDFs.

Odyssey

Released in April 2003, with ILLiad version 6.2.0.1, Odyssey has developed into a significant electronic document delivery component for ILLiad users. Odyssey enables document transmission between ILLiad sites and has been expanded, with Atlas's Standalone product, to include non-ILLiad sites as well. The ILLiad component consists of such features as inclusion of all request information, auto-updating of the request, and the Trusted Sender setting. The latter allows for unmediated receiving: a borrowing library's ILLiad server receives an article sent from a lending library via Odyssey, converts it to PDF format, delivers the article to the web, notifies the customer, and updates the request to "received". This feature may be further modulated by selecting the desired level of staff review. (Connell & Janke, 2006).

Odyssey Standalone is a free version that was released by Atlas Systems during summer 2005 (Miller, 2010). Although Standalone is not built into ILLiad, it allows libraries to send and receive documents to ILLiad libraries using Odyssey, Odyssey Standalone locations, and other vendor's software that supports the Odyssey protocol (Atlas Systems, 2010). It functions similar to Ariel in that it is solely an electronic scanning and delivery mechanism and does not allow the user to initiate and receive requests. Brian D. Miller (2009) of Ohio State University Libraries has created an extremely useful set of FAQs that aim to assist both prospective and current users of Odyssey Standalone in getting the most out of this product.

A search of the OCLC Policies Directory on May 10, 2010 revealed that, out of 1107 current ILLiad sites, 451 officially list Odyssey as a delivery method, along with 131 non-ILLiad sites (OCLC Policies Directory, 2010). These figures reflect a sizable Odyssey user base, yet may not be completely accurate as they are dependent on ILL units keeping their information current, particularly that listed under "Delivery Methods" --> "Copies".

Relais Express

Based in Ottawa, Canada, Relais International is a company that has provided software solutions for interlibrary loan and document delivery since 1995. With customers in Canada, USA, and the UK, Relais has found its market share predominately among larger academic research libraries, national libraries, and archives. Library and Archives Canada, National Institutes of Health, and the British Library are among those institutions that rely on Relais.

Relais Express combines scanning and delivery functions within a single interface. Any TWAIN-compliant scanner may be used and a range of electronic delivery options may be employed: Ariel, Odyssey, fax, post to web in PDF format, and email attachment. Patron and library delivery information is stored in the system. Once a document is scanned, it is properly prepared for delivery according to the specified method, updated, and sent via automated processes (Relais, 2010). Although Relais is not widely used in the United States, it is worthy of mention in the context of this discussion.

BScan ILL

Since 1993, Image Access has provided digitization technologies to commercial markets. In 2004, Image Access created the Digital Library Systems Group (DLSG), a division that focuses on the ongoing development, service, and support of hybrid library digitization products.

BScan ILL is a software package developed by DLSG specifically for interlibrary loan and document delivery units. The software can be used with a variety of scanning devices, but is most often integrated with DLSG's line of Bookeye planetary scanners. BScan ILL provides a single, intuitive document delivery interface that enables staff to produce high-quality images with automatic deskew, book curve correction, fan and gutter removal, etc. The finished document may be transmitted to the receiver via ILLiad/Odyssey, Ariel, Rapid, Clio, FTP or email, while the request is updated in the library's respective ILL management system in the process. BScan ILL automatically reads the requestor's information from scanned pull slips, saving time and eliminating human error.

A growing number of academic libraries involved in high-volume resource sharing and document delivery are using BScan ILL. Represented in this expanding list are important research institutions such as Duke University, Harvard University, M.I.T., and University of Florida (DLSG, 2010).

RapidX

RapidILL was designed by the ILL staff at Colorado State University Libraries in 1997 to provide fast, cost effective article requesting and delivery. Since that time, many libraries have joined what is known as "Rapid" - a total of about 180 sites worldwide at the time of writing. A holdings database common to the system matches requests down to the year level providing a system average fill rate of 95% or greater and enabling consistent turnaround time between members of less than 24 hours (RapidILL.org).

The newest innovation of Rapid is "RapidX", the electronic document delivery mechanism that makes interoperability between disparate systems possible. Via RapidX, lending libraries are

able to transmit documents in TIFF or PDF format to any Rapid site regardless of that site's delivery preference (Odyssey, Ariel, Relais Express, Rapid website, etc.) During the process of converting the document to the appropriate format, RapidX will also automatically insert a coversheet and update the request to "filled" in the Rapid system. According to Jane Smith, Director of Rapid Development and Training, RapidX was first launched at Colorado State University around mid-2009 and will soon be employed by all Rapid sites. (personal communication, May 6, 2010)

LITERATURE REVIEW

Ariel software, the first electronic document transmission system designed specifically for interlibrary loan, was reviewed as early as 1992 by Mary Jackson. At this time, the enhanced capabilities of Ariel over fax transmission were highlighted and the potential for Ariel to become the de facto standard for document transmission was recognized. Landes (1997) echoed Jackson's findings, delving deeper into hardware and software requirements and costs, while further updating technical product information. Ariel literature peaked at the turn of the millennium when the Journal of Interlibrary Loan, Document Delivery & Information Supply (now the Journal of Interlibrary Loan, Document Delivery & Electronic Reserve) devoted an entire issue to experiences of institutions using the software (Ives, 2000). Around the same time, publications began to examine how Ariel functionality could be enhanced through the use of software such as Prospero (Schnell, 1999; Sayed, Murray, Wheeler, 2001; Weible, Robben, 2002) and DocMorph (Franke-Webb, 2001).

Comparatively, there has been a dearth of formal literature published on Odyssey since its inception in 2003. Connell and Janke (2006) published a study which evaluated turnaround time between Ariel and ILLiad Odyssey. Examining data across two separate institutions, the authors found that, with the Trusted Sender setting turned on, Odyssey delivery was faster than Ariel (p.42). Most of the information concerning Odyssey can be gathered via websites, some of which are discussed in this paper. Although the Rapid system has been around for some time, the RapidX component has not been discussed in the literature up to this point. Rapid itself has been covered in recent years by Smith (2006) and Delaney (2007).

BScan ILL has only recently been mentioned in the literature. Staff from the State University of New York at Buffalo and Empire State College briefly discussed BScan ILL and its role in providing expanded resource sharing. BScan ILL dramatically improved image quality and processing speed, while offering greater flexibility in electronic delivery methods (Bertuca et al., 2009). The efficiencies achieved through the use of BScan software were also discussed in the context of scanning productivity at Iowa State University Library (Pedersen & Runestad, 2009).

Although Relais Express was not explicitly mentioned, the document delivery component of the Relais product was discussed to some extent in a comparison of procedures in University of California, San Diego's (UCSD) interlibrary loan and course reserves units. In 2009, UCSD was in the process of implementing Relais ILL and anticipated that the software would resolve resource contention issues found when using Ariel and allow dispersed ILL departments to work

effectively in a network environment (Elliot & Longacre, 2010). The Relais product has also been covered by Cornish (2000) and Guadagno (2005).

To date, the authors are unaware of a study that has systematically examined the range of electronic document delivery methods available to libraries across the United States and garnered user feedback regarding these methods.

METHODOLOGY

In Spring 2010, the authors created a survey using Google Docs that was distributed to STARS-L, Arie-L, Odyssey-L, ILL-L, and Workflowtoolkit-L listserv subscribers as well as members of the ILLiad Webjunction group. These forums all focus on resource sharing, including interlibrary loan and document delivery, therefore being appropriate places to solicit response on electronic document delivery methods. At the time of the survey, there were thousands of combined subscribers to these various lists, both national and international. However, the authors purposely limited the scope of the survey to U.S.-based institutions by framing the informed consent statement and survey questions to reflect this intent. This was done in an effort to keep the study more focused and manageable.

In order to ensure confidentiality, survey respondents were not asked to identify themselves or their institution. Duplicates were eliminated based on location and identical responses to questions. Since the results of this survey represent a self-selected group of practitioners in the area of resource sharing, they cannot be deemed conclusive or representative of all libraries. Nevertheless, insight can be gained from the many respondents, representing libraries across the United States and its territories. For reference purposes, appendices are included. Appendix A contains the online survey and the formats for each question as they originally appeared on the web. Appendix B includes the scanner types used in conjunction with the Ariel and Odyssey software.

RESULTS AND DISCUSSION

There were a total of 104 respondents who participated in the web survey during April 2010. The types of libraries represented were unevenly distributed, with 90% Academic, 3% Public, and 7% Special (including corporate, medical, etc.) There were respondents from most states across the country. Those states with the most response, in order of magnitude, were: New York (13), Massachusetts (7), Pennsylvania (7), Texas (7), Illinois (6), North Carolina (6), and Florida (5). Most other states had between 1 and 4 respondents, although no responses were recorded for Alabama, Delaware, Hawaii, Idaho, Maine, Mississippi, Montana, New Hampshire, New Jersey, Rhode Island, South Dakota, or Wyoming. In addition to those from the United States, there was also a response from the U.S. territory of Guam.

Of the total, 66% send documents via Odyssey, either with ILLiad or as a standalone product. Of those, 89% employ Odyssey integrated with ILLiad, while 11% take advantage of the free standalone version. Most Odyssey users (93%) both send and receive via the software, yet 3% only receive and 4% only send.

Ariel is utilized by an even higher proportion of libraries in the sample (78%). Of those, the overwhelming majority (93%) have purchased the software. Only 7% have chosen the annual subscription option, most likely due to budgetary reasons or projection of future use. 95% of Ariel users send and receive documents via the software and 5% employ it on a receive-only basis.

Electronic document delivery via email comes out above any proprietary methods, being used by 89% of respondents. Surprisingly, fax is still used by 64% of libraries to some degree. The method of uploading documents to a server and making those available to borrowers is used by 21%. Prospero's use is certainly waning, being used by only 5% of those surveyed. 8% of respondents used some "other" mechanism: Relais Express, RapidX, or a tool such as www.transferbigfiles.com. (See Table 1)

TABLE 1 Electronic Document Delivery Methods in Use by Responding Institutions

Document delivery systems in use				Percent of respondents using method
Odyssey				66%
ILLiad Odyssey	89%			
Odyssey Standalone	11%			
		Send & Receive	93%	
		Receive only	3%	
		Send only	4%	
Ariel				78%
Purchased software	93%			
Annual subscription	7%			
		Send & Receive	95%	
		Receive only	5%	
		Send only	0%	
Email				84%
Fax				64%
Upload to server				21%
Prospero				5%
Other				8%

Among libraries that use Ariel and Odyssey, 70% use both on a single PC, while 30% use them on separate PCs. ILL Management Systems in use include: ILLiad 65%, Clio 15%, Homegrown 10%, Relais 1%, Other 15%. The total adds up to more than 100%, as some respondents indicated multiple systems.

While it is important to ascertain what methods are currently being used, it is equally important to see what methods have recently been discontinued or will be discontinued in the near future. Although Ariel exhibits high use by libraries, it has the highest rate of abandonment. Fax is second, as many libraries find it no longer necessary due to the ease and speed of email transmission as well as the overall poor quality of faxed documents. That said, one respondent did recently discontinue transmission via email, while another discontinued uploading to server, as it forced activity outside of their system's workflow. Prospero's use is dropping, making the once-prominent companion to Ariel rather insignificant. A few institutions either have dropped Odyssey recently or are planning to drop it in the near future. Two of these were never able to get the Standalone version to work, while the other has opted to rely on RapidX. (See Table 2)

TABLE 2 Recently Discontinued Methods/ Methods to Be Discontinued by Respondents

Discontinued systems	Percent of respondents indicating recent or future discontinuation
Odyssey	3%
Ariel	22%
Email	1%
Fax	9%
Upload to server	1%
Prospero	4%
Other	4%

Respondents were also asked what electronic document delivery methods they have recently adopted or will be adopting in the near future. Unsurprisingly, not a single library specified Ariel in this regard. Odyssey, on the other hand, came out on top as the method adopted most. To a lesser extent email, fax, uploading to server, and other methods such as RapidX have been recently adopted or planned for future adoption. (See Table 3)

TABLE 3 Recently Adopted Methods/ Methods to Be Adopted by Respondents

Adopted systems	Percent of respondents indicating recent or future adoption
Odyssey	21%
Ariel	0%
Email	2%
Fax	1%
Upload to server	5%
Prospero	0%
Other	5%

Ariel

Ariel users expressed a range of likes and dislikes with the software, which we list below, but they also provided illuminating comments that speak to Ariel's unique history. One respondent commented that "Ariel was built by librarians for library use and is suited to ILL". This respondent is referring to RLG and its role in developing Ariel. Similarly, other respondents cite a history or habit of using the software:

- "Ariel has been in use here since the mid 90s"
- "We received a grant for Ariel approximately 9 years ago and have used it ever since."
- "Ariel is the standard"

This familiarity with the software, cultivated through years of use, is echoed in favorable comments about Ariel. Other respondents articulated an imminent decline in the software, which we list further below. There are contradictions, though, in responses. Some state that Ariel is cost-effective and easy to use. Others state the contrary. Ariel clearly has both fans and detractors, but the most important question raised by our respondents is, what is the future of Ariel?

Respondents cited a range of reasons why they like Ariel. The top three reasons included: Many libraries and/or consortium partners use Ariel (22%); It is simple and easy to use, and works well with older operating systems and hardware (19%); and thirdly, Ariel is speedy (15%). Respondents also stated that Ariel works well, most of the time. Documents can be received or imported through email or Odyssey, and uploaded onto the library's web server for patrons to easily access. PDFs can also be conveniently emailed via Ariel to libraries that do not have Ariel or Odyssey. Scanned articles are available on the local server, so they can be redelivered easily, even as a PDF file, if initial delivery fails. The address book is easy to use and is saved during upgrades. Respondents also appreciate the delivery log or queue, which is searchable. The log conveniently lists problems with received, sent or emailed articles. Because Ariel does not rely on initiating the scanner for each page, it scans faster. PDF and TIFF formats are also supported.

One respondent stated that Ariel interacts better with their scanner, and with self-feeding scanners. Secure document transmission was another valued feature. One respondent liked the customer support. The scan settings are adjustable, and Ariel handles color documents. Ariel is good for large files; works well with ILLiad; includes libraries that do not have Odyssey; and allows batch sending.

Ariel users indicated reasons why they use Ariel over Odyssey. Most stated that if the borrowing institution does not have Odyssey, they will use Ariel instead (18% of respondents). Other respondents stated that Ariel has a larger user base. Some choose Ariel for scanned articles, and Odyssey only for articles from electronic journals. Also, Ariel is preferred because it monopolizes the scanner. If the borrowing library prefers Ariel, respondents said they would choose Ariel over Odyssey. For large PDF files, one library stated that it is easier for them to send the article through Ariel rather than convert it to a TIFF file to be sent through Odyssey. Unlike Odyssey Standalone, articles do not require rescanning in order to resend a document. The "send to patron" email function in Ariel is used to send documents to libraries that lack Ariel or Odyssey because the transmission is better than fax. Some long-time Ariel users interestingly said they prefer to use Ariel "out of habit". One Docline library stated that Ariel works better than Odyssey. A Rapid library claimed that ArticleReach and Docline do not integrate well with ILLiad, so they use Ariel instead. Another Rapid library stated that for Rapid requests, they use Ariel, because many Rapid libraries still use it. A few libraries (4) expressed that they are not ready for Odyssey due to budgetary constraints or a lack of time. Other reasons include: microfilm scanner does not work well with Odyssey; Ariel is part of the existing workflow; some libraries only have Ariel; there are more export options for documents that are received; Ariel is common in the state; documents upload onto a secure server; and when Odyssey fails, Ariel is their backup option.

Technical problems and the lack of customer support from Infotrieve were frequently cited as reasons why respondents dislike Ariel. An overwhelming 40% of respondents expressed their dissatisfaction with customer support. Conflicts with the scanner between Ariel and Odyssey were also frequently cited to be a nuisance. Other technical problems included: Slow and prone to errors and crashes; inconsistent connections; does not work with Vista; firewall and IP address issues; problems with email server in terms of delivering articles to patrons; difficulty setting up the program and loading it onto another machine; problems sending to institutions with different versions of Ariel; and a need for institutional staff or IT support with the program. According to respondents, a number of features and services are lacking: Updates are infrequent; deliveries are not updated in OCLC or ILLiad; Ariel needs better security; and varying shades of black to gray do not transmit well. Various inconveniences were also cited: Ariel may not send larger docs; editing documents can be clunky; the program needs to be on in order to receive; it does not have a log for email transmissions; users cannot change an email PDF attachment name or subject line easily; and in borrowing, documents are delivered as TIFFs which are too large to work with and must be converted to PDFs. Some stated that Ariel is not user friendly and lacks a usable manual. The documentation is also confusing. Some respondents stated that Ariel is expensive, the technology outdated and the number of Ariel institutions limited, making Ariel less desirable.

Some of the problems cited above compel respondents to phase out Ariel. Conflicts with Odyssey, lack of support, infrequent updates, firewall issues, technical problems, and the high

cost to maintain and update Ariel are convincing libraries to discontinue it. Programs such as Relais Express, RapidX and Odyssey are competitors that are also drawing libraries away from Ariel. Comments from two respondents express a bleak future for Ariel:

- "Ariel is a doomed product and we want to reduce our dependence on it to the smallest possible footprint so that when it's no longer supported by the vendor it will be a non event."
- "We discontinued Ariel because support from Infotrieve was minimal, and it took too much of our IT staff time to maintain so many systems."

Odyssey

Among those libraries that use ILLiad Odyssey, there were consistent reasons why they like it. The number one reason involved Odyssey's integration with the ILLiad management system which enables auto-updating and patron notification of requests (42%). Related to this, 25% specifically mentioned Trusted Sender as being a standout feature, as it allows for unmediated delivery of articles to patrons' ILLiad accounts and speeds turnaround time. Respondents also remarked that Odyssey requires very little staff intervention/ is easy to use (15%) and that it is fast and efficient (11%).

A number of positive comments were tied to the scanning function. Odyssey is compatible with most scanners and allows for flexibility in scanning from multiple PCs. Scanning features included the ability to easily preview scanned pages and edit them with many tools, support for color/grayscale, batch page rotation, hot key to trigger scanner, and the ability to mix resolutions and color depth within a single document to reduce file size. Odyssey Helper, an ILLiad module that batch processes scanned articles for document delivery and lending, was also mentioned. One respondent believed that Odyssey simplifies the transmission of articles from e-journals. A few others pointed out that customer support from Atlas and OCLC is reliable.

Odyssey Standalone was valued primarily because it is free and easy to configure/use. Users are also able to easily deskew and edit images in other ways. Some find that Odyssey Standalone coexists with Ariel without problems and that it seems to be able to handle larger document transmissions than Ariel.

Odyssey users specified reasons for using Odyssey over Ariel. 30% of Odyssey users (ILLiad and Standalone combined) were emphatic that Odyssey is always their first choice of electronic document delivery. If Odyssey is the preferred/only method used by the borrowing institution, this also factors in. Trusted Sender and integration with ILLiad ranked high. Less staff intervention, less manual updating, and less chance of human error were cited. This leads to more efficient delivery: "If articles arrive after-hours or on weekends, patrons receive them immediately without ILL staff intervention". One respondent believed Odyssey worked better with their scanners (Ricoh Aficio IS330DC and HP Scanjet 8290). After locating a print article or checking in an item, Odyssey also presents the option to scan right away. Additional scanning features that set it apart from Ariel include: a larger preview window of the current scan, higher success rate with color scans, and a greater range of document editing tools. Installations and upgrades appear to be smoother as well and are facilitated by OCLC/Atlas (ILLiad version).

According to some, an increasing amount of consortia partners are opting to use Odyssey. One respondent carried this further by saying, "We wish all libraries would use Odyssey. It would simplify our procedures."

Respondents criticized ILLiad Odyssey because of the following: Not as many libraries/smaller schools have it as Ariel (therefore they must rely on email as well) (10%); Imported files/sent documents must be in TIFF format (10%). Negative comments related to the scanning interface included: errors with color scans/large imported files, slow scanning (due to initiation of scanner for each page), inability to adjust brightness/contrast, less flexible image settings, no recognition of black edges/autocropping, and extra mouse clicks involved in the scanning process. Other scanning issues included Odyssey not working well with a particular scanner, problems running alongside Ariel, resends more problematic than Ariel (because of the way the document is tied to a specific ILLiad transaction), and "clunkiness" in clearing up failed deliveries. A few respondents believed that it did not work well with their existing workflows. One respondent pointed out that when hosted by OCLC/Atlas, a failed scan necessitates rescanning the entire document. The inability to "post to web" on the lending side, select Odyssey OR Ariel on a per request basis, and easily send to Odyssey Standalone sites were mentioned. Annoyance was expressed over the need to include a coversheet for Standalone sites for the purposes of request identification. A Docline library felt that Odyssey could be improved for libraries using that system. A RAPID library expressed a similar sentiment by saying that "Odyssey should be designed to work with ILLiad like RapidX works with RAPID".

The user base for Odyssey Standalone was appreciably smaller, yet they had their share of criticism. This comment was echoed amongst respondents: "The Standalone version allows other institutions using ILLiad to send articles to us but does not automatically include any request information (such as OCLC ILL number or transaction number, which show up for ILLiad Odyssey users)". If an article is not successfully delivered, it must be scanned again. One respondent believed the address book is limited by the inability to assign one IP address to multiple libraries. However, the authors are aware of a workaround for this problem, which can be found at https://osu.illiad.oclc.org/illiad/osu/lending/odysseyfaq.html. Not being able to remove unsent items from the queue was mentioned. The fact that Odyssey Standalone does not have an email capability in order to deliver to end users or other libraries was pointed out. Others believed it to be slow, clunky, and confusing. One respondent cited firewall issues, while another brought attention to the fact that the software times out after 4 attempts at electronic delivery. In certain cases, potential users are unsuccessful at getting Odyssey Standalone to work with their existing systems. Since fewer libraries have Standalone than either Ariel or ILLiad Odyssey, this also appears to be a disincentive.

Based on responses for Ariel and Odyssey, we identified features and characteristics that libraries want and need from a document delivery program. Libraries need reliable technical support. They want interoperable software, integrated with an ILL program, making transaction updates seamless and automated. For example, automatic updating in OCLC or the Trusted Sender feature in ILLiad where documents received via Odyssey are sent directly to the patron without ILL staff intervention, are highly desirable. Libraries want regular and inexpensive software updates, including updates that are compatible with new operating systems (e.g. Vista and Windows 7). They want fast and secure document transmission, and the ability to deliver

any file type (PDFs, TIFFs). They want a program that is robust and reliable, easy to install, and that requires minimal IT staff support. Other desirable features include:

- ability to quickly resend documents if initial delivery fails
- ability to store scanned files temporarily or until deleted
- compatibility with various scanner brands and models, and does not monopolize the scanner
- easy to edit documents before sending
- ability to send large files and color documents
- document preview before sending
- option to deliver to patrons

CONCLUSION

Respondents identified both beneficial features of and drawbacks to existing document delivery methods. Their responses suggest that no software meets all of their document delivery needs. This may explain why 95% of respondents use more than one delivery method, and why 49 out of 66 ILLiad libraries (75%) use Ariel along with Odyssey. One respondent aptly writes: "The more electronic DD options the better -- you never know what the other institution might have." Respondents stated that technical problems, the number of libraries using a particular delivery method, and the type of document, among other reasons, determine what delivery method they use for each transaction.

Electronic document delivery software may be system-dependent, outdated, prohibitively expensive, etc., which creates stumbling blocks to interoperability. Ariel is system-independent, but is not being developed and therefore, may not work well with future operating systems. Atlas Systems has shown magnanimity in releasing the free standalone version of Odyssey. However, the uptake of this open source product has been rather slow. Some libraries have found its functionality too limited, while others have not been able to integrate it into their existing systems. Perhaps software with the accessibility of Odyssey Standalone, yet the interoperability of RapidX will hold the most future promise. The document delivery horizon is certainly wide open for innovation and improvement.

REFERENCES

Atlas Systems. (2010). Odyssey-product information. Retrieved from http://www.atlas-sys.com/products/odyssey/

Connell, R., & Janke, K. (2006). Turnaround time between ILLiad's odyssey and ariel delivery methods. *Journal of Interlibrary Loan, Document Delivery & Electronic Reserve, 16*(3), 41-56. doi:10.1300/J474v16n03_07

Delaney, T. (2007). Rapid and the new interlending: A cooperative document supply system in the USA. *Interlending & Document Supply, 35*(2), 56-59. doi: 10.1108/02641610710754042

Franke-Webb, J. (2001). Using DocMorph in conjunction with ariel to expand digital document delivery options. *Journal of Interlibrary Loan, Document Delivery & Information Supply, 12*(1), 85-92. doi:10.1300/J110v12n01_08

Holbert, G. L., Sayed, E. N., & Murray, S. D. (2002). Prospero power: Web-based document delivery allowing libraries to exchange documents through interlibrary loan; panel presentation given October 10, 2001, international scientific conference in library and information service, V. Vernadsky National Library of Ukraine, Kiev, Ukraine, October 9-11, 2001. *E-JASL: The Electronic Journal of Academic and Special Librarianship, 3*(1/2), 1.

Infotrieve. (2009). Ariel interlibrary loan software. Retrieved from http://www.infotrieve.com/ariel

Ives, G. (2000). Introduction. *Journal of Interlibrary Loan, Document Delivery & Information Supply, 10*(4), 1 - 2. doi:10.1300/J110v10n04_01

Jackson, M. E. (1992). Using ariel, RLG's document transmission system to improve document delivery in the united states *Interlending & Document Supply, 20*(2), 49-52. doi:10.1108/02641619210154477

Landes, S. (1997). The ARIEL document delivery system. *Journal of Interlibrary Loan, Document Delivery & Information Supply, 7*(3), 61-72. doi:10.1300/J110V07N03_08

Lavigne, J., & Eilts, J. (2000). The evolution of ariel. *Journal of Interlibrary Loan, Document Delivery & Information Supply, 10*(4), 3-7. doi:10.1300/J110v10n04_02

Miller, B. (2009). Odyssey Standalone FAQ. Retrieved from https://osu.illiad.oclc.org/illiad/osu/lending/odysseyfaq.html

Miller, B. (2010). What every ILLiad library should know about Odyssey Standalone. 2010 ILLiad International Conference, Virginia Beach, VA. Retrieved from https://www.atlas-sys.com/conference/ConferenceSessions.aspx

Morgen, E.B. & Hersey, D. (2003). Prospero 2.0. *Journal of the Medical Library Association, 91*(3), 381–382.

Online Computer Library Center, Inc. (2010). OCLC Policies Directory. Retrieved May 10, 2010, from https://illpolicies.oclc.org/

Online Computer Library Center, Inc. (n.d.). Uniting OCLC and RLG. Retrieved from http://www.oclc.org/research/about/oclcrlg/default.htm

Open Source Systems for Libraries (oss4lib). (2010, May 12). ILL-DD board. Retrieved from

http://oss4lib.org/node/569

RapidILL.org. (2010). RapidILL: Frequently Asked Questions. Retrieved from https://rapid2.library.colostate.edu/PublicContent/AboutRapid.aspx

Sayed, E. N., Murray, S. D., & Wheeler, K. P. (2001). The magic of prospero. *Journal of Interlibrary Loan, Document Delivery & Information Supply, 12*(1), 55-72. doi:10.1300/J110v12n01_06

Schnell, E. H. (1999). Freeing ariel: The prospero electronic document delivery project. *Journal of Interlibrary Loan, Document Delivery & Information Supply, 10*(2), 89. doi:10.1300/J110v10n02_08

Smith, J. (2006). The RAPIDly changing world of interlibrary loan. *Technical Services Quarterly, 23*(4), 17-25. doi:10.1300/J124v23n04_02

Weible, C. L., & Robben, C. (2002). Calming the tempest: The benefits of using prospero for electronic document delivery in a large academic library. *Journal of Interlibrary Loan, Document Delivery & Information Supply, 12*(4), 79-86. doi:10.1300/J110v12n04_08

APPENDIX A

Web-Based Survey – "2010 Electronic Document Delivery Options Study"

1. What is your library type?

    a. Academic

    b. Public

    c. Special

2. In which U.S. state is your library located? (select from list of states, including District of Columbia)

3. If outside the U.S., please specify your location. (short text box for territories such as Guam)

4. What electronic delivery methods do you use to lend articles?

    a. Odyssey

    b. Ariel

    c. Email

d. Fax

e. Upload to server

f. Prospero

g. Other:

5. Why did your institution decide to use this or these method(s)?

6. Have you recently adopted/are you planning on adopting any of these electronic delivery methods in the next 12 months?

a. Odyssey

b. Ariel

c. Email

d. Fax

e. Upload to server

f. Prospero

g. Other:

7. Why?

8. Have you recently discontinued/are you planning on discontinuing any of these electronic delivery methods in the next 12 months?

a. Odyssey

b. Ariel

c. Email

d. Fax

e. Upload to server

f. Prospero

g. Other:

9. Why?

10. In what way do you use Ariel?

    a. Send and receive

    b. Receive only

    c. Send only

11. What do you like most about Ariel?

12. What do you like least about Ariel?

13. Do you use Ariel over Odyssey for any specific reasons?

14. What model scanner are you using with Ariel?

15. In what way do you use Odyssey?

    a. Send and receive

    b. Receive only

    c. Send only

16. What version of Odyssey do you use?

    a. Included with ILLiad

    b. Standalone version

17. What do you like most about Odyssey?

18. What do you like least about Odyssey?

19. Do you use Odyssey over Ariel for any specific reasons?

20. What model scanner are you using with Odyssey?

21. Do you use Ariel and Odyssey on a single PC? (YES/NO)

22. If so, what issues do you find with this arrangement?

23. What type of ILL management system do you use?

a. ILLiad

b. Clio

c. Relais

d. homegrown system

e. other:

24. Additional comments:

APPENDIX B

Number (#) next to model indicates the number of respondents who specified identical scanner

Ariel – Scanner models

- Bookeye (unspecified model) (6)
- Bookeye 2 (2)
- Bookeye 3
- Canon Canoscan 8000F (2)
- Canon ImageRunner 400E
- Canon iR3235/iR3245 PS3
- Epson GT15000 (2)
- Epson Perfection 1640SU
- Fujitsu flatbed/ADF
- Fujitsu fi-4120C
- Fujitsu fi-4220-C (2)
- Fujitsu fi-4340C (8)
- Fujitsu fi-5220C (5)
- Fujitsu fi-5750C (2)
- Fujitsu fi-6230
- Fujitsu fi-6240dj
- Fujitsu fi-6770
- Fujitsu M3093G
- Fujitsu M3096Gx
- Fujitsu M4097 D (2)
- Fujitsu ScanPartner 15c (2)
- Fujitsu ScanPartner 620c
- Fujitsu ScanPartner 93Gx
- HP Officejet 7130
- HP Scanjet (unspecified model)

- HP Scanjet 3500
- HP Scanjet 5550C
- HP Scanjet 5590 (2)
- HP Scanjet 7000
- HP Scanjet 7400c (3)
- HP Scanjet C7710A
- HP Scanjet 8250
- HP Scanjet 8270 (2)
- HP Scanjet 8300
- HP Scanjet N8460
- Lanier LP425
- Minolta PS 5000C (2)
- Minolta PS7000 (9)
- Minolta 7145
- Plustek Opticbook 3600
- Ricoh IS760D
- Ricoh Aficio IS330DC (3)
- SCSI scanner device
- Toshiba estudio 351c
- WideTek (unspecified model)
- WideTek 25
- WideTek Super B
- Wide Tek flat bed scanner
- Xerox Documate 510

Odyssey – Scanner models

- Bookeye (unspecified model) (8)
- Bookeye 2
- Bookeye 3
- Canon C 3380
- Canon Canoscan8000F (2)
- Epson GT2500
- Epson GT15000
- Fujitsu flatbed
- Fujitsu fi-4120C
- Fujitsu fi-4200c2
- Fujitsu fi-4340C (8)
- Fujitsu fi-5220C (2)
- Fujitsu fi-5750C
- Fujitsu fi-6230
- Fujitsu fi-6240dj
- Fujitsu fi-6770
- Fujitsu ScanPartner 93Gx (2)
- Fujitsu ScanPartner 620c

- Fujitsu M3096Gx
- Fujitsu M4097D
- HP LaserJet 3015
- HP LaserJet M5053 (3)
- HP LaserJet M5590
- HP Scanjet 7000
- HP Scanjet 8250
- HP Scanjet 8270
- HP Scanjet 8290
- HP Scanjet 8300 (2)
- HP Scanjet N8460
- Konica Minolta 7145
- Lanier LD 425c
- Minolta PS 5000c
- Minolta PS 7000 (5)
- OCE 3165
- Plustek Opticbook 3600
- Ricoh Aficio IS330DC (2)
- Ricoh IS760D
- WideTek (model unspecified)
- WideTek 25
- WideTek (w/B-scan software) (3)
- Xerox Documate 510