**While You're Up, Dial Me an *OATS*—
We're Still Waiting for the
Document Delivery Revolution**

In the last 20 years, information science and technology have revolutionized the way researchers use the literature. We have described how many of the newer information systems have radically transformed the retrieval of bibliographic information. Indeed, it is safe to say that the ancient problem of "bibliographic control" has been solved.[1] Citation indexing, keyword indexing, and online access make it possible to rapidly produce a bibliography on almost any subject.

However, online systems such as *MEDLINE* and *SCISEARCH*® are not backed up with equally instantaneous access to original material. You can often identify a relevant article in seconds. But if your library doesn't have that article conveniently or quickly available, your frustration level is rapidly exceeded. So we need to improve document delivery services. The existing interlibrary loan systems just are not adequate for the task. And I don't believe we need to wait for the time when every scientific journal or book is available in machine language.

Libraries have a long history of reciprocal borrowing.[2] In the days when scientists could rely on a small stock of journals to satisfy most needs, local libraries could limp along on interlibrary loans. The inconvenience entailed by the occasional odd request that had to be procured through interlibrary loan was tolerable. But today, the demand for articles not stocked by a given local library is quite large. According to Henriette D. Avram, Library of Congress, approximately 20 million items are requested annually through interlibrary loan.[3] This number is expected to double in just a few years. Since most libraries have neither the funds nor the shelf space to include in their holdings all the journals or books published, their clients must increasingly suffer the inconvenience of interlibrary loan. Cuts in library budgets will only increase the problem and shift costs to requesters.

Consider what a traditional interlibrary loan involves. First you have to provide the basic reference. Then a librarian must *verify* the accuracy of the bibliographic information. An institution which has the requested document must be located. This is usually done by specialized union lists or catalogs, but computers are increasingly being used. Next, the request must be communicated to the potential lending institution, which must, in turn, locate the journal. If the journal is not on the shelf, it may have to be found through circulation records. Finally, when the journal is located, a copy of the article must be made because the journal is usually not loaned out. Indeed, the name "interlibrary loan" is a euphemism for photocopying in most cases. Given all the steps involved, interlibrary loan is a slow process, even when the lending institution is nearby.

In addition to being slow, interlibrary loan is expensive. But the costs are hidden. Traditionally, libraries did not charge each other for loans. But for larger libraries that loan more than they borrow, the administrative costs of these

loans are becoming prohibitive. The trend now is for lending institutions to charge a fee, usually about $5.00 to $10.00 per transaction. As Richard De Gennaro, University of Pennsylvania, recently wrote: "Interlibrary loan is becoming too important to be continued as a free service, and...it is time to put a realistic price on it and establish it on a more rational and businesslike basis."[2] Thus, interlibrary loan appears to be losing one of its chief attractions—its traditionally low cost.

Of course, interlibrary loan never really was "free." Even if lending institutions didn't charge borrowers, somebody had to absorb the personnel, postage, and general administrative costs of interlibrary loan. One recent study[4] examined interlibrary loan transactions over a two-week period at the University of Oklahoma. The cost to the borrowing library was found to be about $5.00, while the cost to the lending library was about $5.50. If this library is typical, then the total expense of an interlibrary loan transaction would be about $10.50. Much higher figures are often quoted, depending upon the treatment of overhead.

Actually, the methodology used in the University of Oklahoma study produced a conservative estimate. For example, any costs that were subsidized by outside sources were not counted. This included teletype communication, the primary method of transmitting loan requests at that library! Recently, Robert Campbell, Blackwell Scientific Publications, reported a study by King Research which indicates that librarians may regularly contact at least two other libraries in trying to locate a request. This duplication of effort is expensive. The actual costs of most interlibrary loans may be in the range of $15.00 to $20.00.[5] Some informal estimates show that a single interlibrary loan request may even cost up to $29.00—$12.00 for the borrower and $17.00 for the lender. And no one has placed a value on your time if the delay is inordinate. Sometimes, by the time a document arrives, the requester has for-

gotten the original reason for wanting it.

To improve their efficiency, libraries have recently begun to band together into networks. Most libraries have always belonged to "affinity groups," informal groups of cooperating libraries within a given geographical area. The new networks, however, are more formalized, and can transcend geographical boundaries.

The first, and perhaps best known, of these networks was the Ohio College Library Center, now known as the Online Computer Library Center, Inc. (OCLC). In OCLC, bibliographic information for the combined holdings of the member libraries is placed in a central data base. Members can locate documents through the network, but only after paying a fee.

Fees for members vary depending on which OCLC services are used. For example, acquisitions, cataloging, serials control, and interlibrary loan systems are all available. But generally, a member pays OCLC only for those transactions actually made. An average interlibrary loan for a requesting member costs $1.26. A partial user and nonmember, on the other hand, pays $1.51 for an interlibrary loan. This is in addition to an advance fee based on the type of service used. The fee for title search services is $6,000 plus an additional $3,000 for interlibrary loan of documents located. If a nonmember does not actually use OCLC services often enough to equal the advance fee, it doesn't receive a refund. Partial use of OCLC is not encouraged because partial users do not contribute bibliographic information to OCLC data bases.[6] Using OCLC solves the location problem. But the borrowed documents are still delivered by mail. OCLC is primarily a shared cataloging network that concentrates on locating sources for books and journals. But it has an active research project whose goal is the implementation of a system for electronic delivery of documents.

In the meantime, libraries that *can* afford to use OCLC systems are beginning to see a marked improvement in interli-

brary loan. According to Bob Gorin, Florida State Library, the OCLC interlibrary loan system now fills up to 80 percent of the document requests it receives. Of these, 86 percent are processed and shipped within five working days.[7] Another network, Research Libraries Group (RLG), recently found that its average interlibrary loan turnaround time ranged from four to 15 days.[8]

But by themselves, library networks won't solve the document delivery problem. Some information professionals look to networking, coupled with technological advances, to provide a solution. For example, a preliminary study for the Commission of the European Communities (once known as the Common Market) proposed an electronic delivery system called Automatic Retrieval of Text from Europe's Multinational Information Service (ARTEMIS).[9] As proposed, ARTEMIS documents would be stored on magnetic tapes and transmitted via telephone wires to printing centers, where the full text would be reproduced for users.

A consortium of scientific and technical publishers has proposed yet another technology-based document delivery system. At present, the consortium includes publishers like Blackwell, Elsevier, Pergamon Press, Springer, and Academic Press. The system they envision is called Article Delivery Over Network Information Service (ADONIS).[10,11] ADONIS members would provide journal articles in machine-readable form for storage on videodiscs. When an article is requested, a computer would locate it on the appropriate disc. The system would transmit the article via satellite to a laser printer at the user's end. Plans for ADONIS were actively discussed at the latest meeting of the International Association of Scientific, Technical, and Medical Publishers held in Frankfurt.

Another document delivery system being discussed in Europe is Article Procurement with On-Line Ordering (APOLLO). The principle behind APOLLO is that documents can be located using bibliographic data bases accessible through Direct Information Access Network for Europe (EURONET/DIANE), ordered through EURONET's telephone network, and transmitted to users via the satellite facilities of the European Space Agency.[11,12] It is hoped that by starting APOLLO, even on a small scale, industry will become interested in developing new document delivery technologies. The information learned from the APOLLO project could eventually help develop a complete document delivery service.[12]

But the technology to accomplish all of these systems is still state of the art. There is good reason to believe that one day soon the technology for storing and transmitting journal information will be as practical as videodiscs for consumer entertainment. But the problems involved in making the overall system cost effective are not trivial.

The fact remains that any solution that relies on still-developing technology is no solution at present. The start-up costs for the laser-disc storage system envisioned by ADONIS are substantial. The laser printers required by local users may be too expensive for all but a few institutions. The new technology *is* attractive and appeals to the futuristic vision of encyclopedic information access. But it is not clear yet if the cost can match other existing methods of providing documents and satisfying the needs of copyright payment. To be successful, a new document delivery technology must be quite comprehensive. So for many years we will need hybrid systems.

One is reminded of the expectations raised by early telefacsimile machines. These machines transmit documents or photos from one point to another by encoding text into electrical signals which are then sent over phone lines. Librarians have looked to facsimile machines for some years now to solve the document delivery problem.[13] But so far they have been disappointed by the expense of these machines and their slowness. Most older machines require about six

minutes to transmit a single page. Ironically, now that newer machines have cut this time down to about 20 seconds, the frustrated expectations of previous years have left a residual resistance to facsimile machines within the information community. Presently, ISI® is using one such machine for receiving requests for documents. And we are now investigating equipment that can deliver a single page at a cost of about $.50. The client will have to obtain a facsimile machine compatible with the equipment we select. But eventually all facsimile machines will adopt an industry standard.

All this is not to imply that we at ISI are pessimistic about the future. Far from it. Electronic document delivery will undoubtedly become a reality one day. And when that day comes we will take full advantage of its potential. However, the coming revolution in document transmission does *you* very little good today. While you're waiting for the day when we can send you articles nearly as fast as you can identify them, you would do well to consider using our *Original Article Text Service (OATS®)*.

OATS is ISI's document delivery service. It is a backup to *Current Contents®* (*CC®*) and our other services. *OATS* was originally established to make articles in *CC* available quickly. It now covers everything published in nearly 7,000 journals in ISI data bases. While it is true that most of the articles people need come from a core group of 500 to 1,000 journals,[14] there is still a problem in coping with the occasional need for other articles. Any article in *CC* or in our online system can be found at ISI. And the average cost per article is currently only about $6.25. This includes first-class postage. (For foreign orders it is somewhat higher and includes airmail costs.)

Those who have used *OATS* over the past 20 years know that it offers significant advantages over other methods of document delivery. One advantage users appreciate is that we still fill most of our orders with *tear sheets* from our extra copies of journals. This ensures that users will not lose the clarity of photographs, color plates, or graphs, which can be crucial in scientific articles. They are, in fact, the closest thing to a reprint. For people who are satisfied with a 50 to 80 percent[15] return on requests, the international reprint exchange system works well. And many *CC* readers rely on reprint requests for their document needs. But as the price of reprints continues to increase, other *CC* readers simply go to libraries to read the journals directly, or send their assistants to make photocopies.[16]

However, at some time during the year we all have a desperate need to get an article as fast as possible. To order an article from ISI, you can simply pick up the phone and dial our *OATS* hotline number, or you can telex your request. The message can be quite brief if you are ordering from *CC* or from an online search. Just use the "oval" number listed in *CC* and the first page number of the article. Of course, bibliographic entries retrieved through any of our online data bases in the ISI Search Network—*ISI/BIOMED ™*, *ISI/CompuMath®*, *ISI/GeoSciTech ™*—also include an *OATS* number for easy ordering. And there is a special command for placing an *OATS* order directly that is comparable to other systems I'll mention later.

If you choose to order by mail, no special ordering format is required. You can, for example, simply check off the articles you want in bibliographies or computer printouts, and send them to us. If you lack a full citation for an article, we may still be able to fill the order. We require only enough information to identify the article you want—just the journal name, starting page, and year, in many cases. And if there is a minor error in the information you've supplied, we'll do our best to correct it and get your article to you. In other words, *we* provide the verification needed in an interlibrary loan transaction. Often, a traditional in-

terlibrary loan request will not be filled unless the full article title is provided.

We use our own internal online computer system to speed up the processing of *OATS* orders. Our staff quickly looks up a requested article, verifies that we have it, and finds it in our library. Journals in our library are arranged by the familiar *OATS* number in *CC*. To ensure correct billing, each *OATS* transaction is entered into the computer. It prints out this record quickly so that it can be shipped together with the tear sheets or photocopies.

Thus, the *OATS* user can readily see which orders have been filled, the cost of each item, and why, should it be the case, we didn't supply a requested article. The user is also notified if a copyright royalty surcharge is required. ISI has always honored the international copyright laws. Most ISI royalty payments to publishers are a uniform fee which is included in our list price. However, some publishers charge higher fees. This is especially true for cover-to-cover translation journals.

If you decide to mail in your *OATS* requests, the easiest way to pay is with *OATS* stamps. They are available in $50 sheets. You simply affix the correct amount of stamps to your order each time you request an article through *OATS*. They can also be used to pay for ISI Press® books, ISI Search Service, or other service costs. This eliminates the high cost of billing for small orders. However, if you plan to use *OATS* regularly, you can also establish an account.

OATS is not the ultimate solution to the document delivery problem. In the end, we too must depend on the mail to send *OATS* articles to users. Over the years, however, we have been quietly applying state of the art technology wherever appropriate to improve our service. For example, we have greatly improved the efficiency with which *OATS* orders are placed. Customers can now place orders online through DIALOG's DIALORDER service, or through SDC's ORBDOC. ISI Search Network has an online *OATS* command and ordering procedure. BRS is also developing an online ordering capability for *OATS*. Any *OATS* orders entered into these systems are stored in a central computer. Several times each day we search this computer's memory for *OATS* orders. Within 48 hours of retrieving these orders, your *OATS* articles are in the mail.

We are investigating other ways to enhance *OATS*. We hope to eventually expand the *OATS* library to include elusive publications, such as proceedings and chapters from multiauthored books. However, this is currently prevented by many publishers. The US copyright law does not include a provision for compulsory licensing, either for books or journals. On the other hand, in the UK the British Library is not prevented from supplying one copy for research purposes without payment of royalty. This privilege does not extend to the US and other countries, though we would think the European Communities would develop uniform legislation.

We are also exploring an agreement to provide accelerated National Technical Information Service (NTIS) documents. NTIS is the central source for the public sale of US government technical reports. Many users prefer to have a single source for all types of documents. There are now many small companies that provide such specialized document delivery services. Many of them use ISI to help supply the needs of their clients and resolve the problem of copyright payments.

The worldwide demand for documents is high and will continue to increase. Existing document delivery problems will not disappear in the near future. These outstanding problems emphasize the need for public policies on document delivery. At ISI, we are eager to talk about these issues with interested parties. We believe that only through the

active cooperation of publishers, librarians, document delivery specialists, and users themselves can satisfying solutions be found. All of these issues were reviewed during active discussions about establishing a National Periodical Center.

Many years ago, I described the ultimate selective dissemination of information (SDI) system, ISI's *ASCAmatic*,[17] in which we would use your interest profile to send you reprints or tear sheets automatically. In the past ten years, few if any have taken advantage of this service. It seems to me that many industrial firms and individuals that could afford such a service have not calculated the potential savings in such an ideal system. Of course, you would receive a few papers that on examination would not be relevant. But it's easier to discard them than to locate and order documents after the fact. Clearly the design of a precise profile would make such a service attractive and efficient.

While few people may heed my advice on using *ASCAmatic*, it is the harbinger of the personalized touch which future electronic systems promise us. In the meantime, the next time your assistant walks in, tell him or her, "While you're up, dial me an *OATS!*"

* * * * *

My thanks to Terri Whitfield Freedman and Abigail W. Grissom for their help in the preparation of this essay.

REFERENCES

1. **Murra K O.** History of some attempts to organize bibliography internationally. (Shera J H & Egan M E, eds.) *Bibliographic organization.* Chicago: University of Chicago Press, 1951. p. 24-53.
2. **De Gennaro R.** Resource sharing in a network environment. *Libr. J.* 105:353-5, 1980.
3. **Avram H D.** Personal communication. 16 April 1982.
4. **Herstand J E.** Interlibrary loan cost study and comparison. *RQ—Ref. Serv. Div.* 20:249-56, 1981.
5. **Campbell R.** Making sense of journal publishing. *Nature* 299(5883):491-2, 1982.
6. **Russell D.** Telephone communication. 21 October 1982.
7. Late breaking news from the offices of *Library Journal/School Library Journal.* *LJ/SLJ Hotline* XI(34):1-2, 1982.
8. RLG news from Pat Battin. *Orrery* 9(38):1, 1982.
9. **Norman A.** *Electronic document delivery.* White Plains, NY: Knowledge Industry, 1982. 226 p.
10. **Cuadra Associates & Berul Associates.** *ADONIS—a new concept to solve an old problem.* Unpublished report, 10 March 1982. 11 p.
11. **Gurnsey J.** *Electronic document delivery—III. Electronic publishing trends in the United States and Europe.* Medford, NJ: Learned Information, 1982. 55 p.
12. The APOLLO project. *Synopsis* 13(3):85-7, 1982.
13. **Shaw R R.** Management, machines and the bibliographic problems of the twentieth century. (Shera J H & Egan M E, eds.) *Bibliographic organization.* Chicago: University of Chicago Press, 1951. p. 200-25.
14. **Garfield E.** Bradford's law and related statistical patterns. *Essays of an information scientist.* Philadelphia: ISI Press, 1981. Vol. 4. p. 476-83. (Reprinted from: *Current Contents* (19):5-12, 12 May 1980.)
15. --------------. Can reprint requests serve as a new form of international currency for the scientific community? *Essays of an information scientist.* Philadelphia: ISI Press, 1980. Vol. 3. p. 307-15. (Reprinted from: *Current Contents* (47):5-13, 21 November 1977.)
16. --------------. The mysteries of ISI's international *OATS* library service revealed (again)! *Essays of an information scientist.* Philadelphia: ISI Press, 1977. Vol. 2. p. 55-7. (Reprinted from: *Current Contents* (15):5-7, 10 April 1974.)
17. --------------. *ASCAmatic—*the personalized journal. *Essays of an information scientist.* Philadelphia: ISI Press, 1977. Vol. 1. p. 22. (Reprinted from: *Current Contents* (31):5, 30 July 1968.)