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AUTOMATED INTERLIBRARY LOAN/DOCUMENT DELIVERY DATA APPLICATIONS FOR SERIALS COLLECTION DEVELOPMENT

**Mary Dabney Wilson and
Whitney Alexander**

In academic libraries, where performance accountability is routinely expected, managers rely on quantitative data to help them make and fine-tune all kinds of decisions. The utility of both interlibrary loan (ILL) borrowing and document delivery (DD) data for making crucial collection development decisions was recognized and described in the library literature well before ILL processes were automated.¹ But automated ILL systems like OCLC do not retain or compile transaction information data. Librarians who wanted this kind of information had to manually compile the data or purchase separate software packages. Compiling and analyzing these records was a laborious and time-consuming process that did not permit ready input from ILL when important collection development decisions were needed.

Interlibrary loan software packages make the collection and analysis of ILL/DD data practical not only for ILL librarians who are investigating fill rates and measuring performance, but also for selectors who are involved in collection building and evaluation. Commercially available ILL software supports routine borrowing and lending by allowing library staff members to electronically capture and retain copies of ILL transactions. ILL staff can then track transactions through the different stages of fulfillment. OCLC transaction data, for example, can be downloaded into local

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ILL/DD databases. The software packages offer report production capabilities necessary for ILL and copyright compliance. Field delimited data can also be imported into relational databases such as Microsoft Access. And once data has been imported in a database, many types of analyses become possible.

This paper will demonstrate the utility of ILL/DD data collected with commercially available software packages for two journal collection development applications at Texas A&M University. The first involves using automated ILL data to re-evaluate previous serials cancellation decisions. The second involves the use of ILL data to help optimally configure an electronic journal package.

LITERATURE REVIEW

Several articles have discussed the use of ILL/DD data for collection development applications. In addition to the pre-automation study already cited, Roberts and Cameron reported on their analysis of interlibrary loan forms, primarily in relation to monograph collection development. They observed that "interlibrary loan activity has always been potentially one of the principal gauges of assessing demands unmet from a library's collection . . ."² Lee and Myers analyzed manual ILL/DD forms by entering data into a spreadsheet for analysis.³

Other articles have described the use of automated ILL/DD data. Beaton and Kirk used automated ILL data to determine turnaround time and to analyze borrowing by academic departments. They also suggested that ILL data might be useful in collection development.⁴ In an article which discussed potential applications for ILL/DD data, Khalil stated that "in order to preserve the quality of our collections and to serve the real, not merely the perceived needs of our users, decisions regarding serial cuts and limited monograph purchases must be based on systematic analysis of collection use."⁵ He outlined several ways in which automated ILL/DD data could be used in collection development decisions, including suggesting that "frequently requested serial titles become candidates for purchase or reinstatement if they have been recently canceled."⁶

Bartolo reviewed earlier studies that applied ILL data to collection development in order to identify data elements that were valuable for this purpose.⁷ She then surveyed existing ILL software programs—ACQUILLA, ILLRKS, ILL Log, ILL Office Program,

and SAVEIT—to determine which data elements each program collected. Lahmon described two methods of providing ILL/DD information to selectors.⁸ One method involved the capture of OCLC ILL transaction screens, WordPerfect, and the ability to sort by call number, while the other used a SAVEIT report sorted by the requestor's academic department.

The issue of the cost effectiveness of periodical access versus ownership has been explored by several teams of authors. An in-house periodical use study by Gossen and Irving reported on the cost effectiveness of maintaining serial subscriptions, as opposed to obtaining articles through ILL/DD, at the State University of New York at Albany.⁹ The authors factored in the cost of ILL/DD using information from the 1991 Association of Research Libraries/Research Libraries Group Interlibrary Loan Cost Study. They found that for titles used ten or fewer times in all disciplines other than science and business, it would have been more cost effective to own the title than to rely on interlibrary loan.¹⁰

Payne and Burke applied a management accounting approach to determine and compare the cost-per-use of obtaining periodical articles three different ways: by subscribing to the publication; by obtaining individual articles electronically through one of two document suppliers, ArticleFirst or UnCover; and by traditional ILL ordered through the British Library Document Supply Centre.¹¹ They concluded that interlibrary loan was more economical than subscribing to the titles studied; that the British Library Document Supply Centre was the best supplier for articles by mail; and that UnCover should be considered for articles for which fax delivery was needed.

Kleiner and Hamaker reported on Louisiana State University's attempt to contain serial expenditures and expand access through the use of subsidized document delivery using CARL UnCover. Among interesting discipline-related findings, this author team found that even for the twenty most frequently requested titles—that is, those with ten or more requests in 1995—it was more cost effective to supply the articles through document delivery than to subscribe to the journals in question. "Total cost for the 426 articles was \$5,629, but a one-year subscription to the twenty journals totals \$28,229."¹²

Perhaps the most thorough cost analysis model, however, is presented by Kingma in his study, *The Economics of Access Versus Ownership*.¹³ Kingma provides an economic model that considered many cost factors beyond simple subscription and document

delivery costs, including patron cost in time spent waiting for article delivery and costs to lending institution of supplying articles. An application of the model in the State University of New York consortial system revealed that the costs for access versus ownership were different for different titles. The value of Kingma's approach is in the comprehensiveness of factors that should be considered in making the decision to provide access or to own.

Two more articles specifically described an analysis of previously canceled titles using ILL/DD data. Kilpatrick and Preece analyzed six months of ILL/DD transactions for serials canceled in 1990 at Southern Illinois University at Carbondale. Their goal was to determine the impact of the cancellations on ILL operations and to evaluate the quality of access provided through ILL/DD.¹⁴ They concluded that cancellation decisions were generally supported by subsequent use analysis. In a thoughtful discussion of the relationship between document delivery and collection development, Etschmaier and Bustion used one year's document delivery data to evaluate previous cancellations at George Washington University's Gelman Library, using Aviso software for the analysis. They found that of 1,031 titles canceled in 1993 and 1994, there were requests for only thirty-five, or 3 percent, of the canceled titles. Only one of the canceled titles was requested as many as four times.¹⁵

BACKGROUND

The Sterling C. Evans Library at Texas A&M University (TAMU) is located on the main campus of the university at College Station. Evans serves 43,000 students (7,000 graduate students and 36,000 undergraduates). It also serves the teaching and research needs of 2,400 faculty. TAMU is a land-grant, sea-grant, and space-grant institution. The historical collections support academic programs in science, technology, and agriculture. Current programs are broadly based and interdisciplinary. The library holds 2.5 million volumes, with approximately 15,000 current journal subscriptions, including electronic full-text titles. The 1997/98 fiscal year materials budget was \$7.2 million, with journal subscriptions and electronic access allocated \$3.1 million, or 43 percent of the materials budget.

TAMU underwent three significant serial cancellation projects in the past ten years. The first two projects, done in 1987 and 1989, were described by

Bustion et al. in an article that discussed serial funding issues.¹⁶ A third major cancellation project was undertaken in 1993. The study that is reported on in this article addresses 3,095 cancellations for the period 1990–1996. Because of the implementation of a library use fee, and with the financial support of the University administration, Evans Library has been able to maintain current subscriptions without further cancellations for the last three years. A modest increase in funding was earmarked for new journal subscriptions during FY 1999. Thus far, to add electronic access to journals, Evans has not had to curtail paper subscriptions.

Evans Library's Interlibrary Services (ILS) staff have used ILL management software since 1995. They employed SAVEIT from May 1995 until June 1997 and subsequently used Clio, a MicroSoft Access based package. TAMU's borrowing policy aims to supply needed materials without cost to users. While it is routine for Evans' ILS staff to enter a maximum cost for article requests, it is important to note that the library does not reject requests based on cost. If users need material, staff make every attempt to obtain what they require. The maximum cost is recorded simply to prompt staff to consider lower cost alternatives. Income from the lending operation, as well as some funds from the student library use fee, enables Evans to absorb the cost of more expensive requests. Evans' ILS follows accepted copyright guidelines¹⁷ and pays royalties whenever more than five articles from the last five years of a journal are requested. In accordance with accepted guidelines, if a journal changes title, Evans Library treats it as a new title, and the copyright compliance counter is reset.

PROJECT I: REASSESSING PREVIOUS JOURNAL CANCELLATIONS

When collection managers decide to cancel a journal subscription, they assume that users will be able to access articles they require from that publication through ILL or document delivery. When cancellation decisions are being made, however, collection managers have no certain way of knowing whether providing access to articles from that title through ILL/DD will be more cost effective than maintaining an ongoing subscription. Cost effectiveness for a particular canceled title can be determined using actually incurred charges once ILL/DD data has been collected over a reasonable period of time. Thus, we wanted to

compare actual incurred costs associated with ILL/DD transactions to the cost of subscribing to canceled publications in order to determine whether there were titles where reinstatement would be more cost effective than borrowing.

METHODOLOGY

First we imported SAVEIT borrowing data for 59,402 transactions for the period May 1995 to June 1997 into a Microsoft Access database. We selected all transactions with the CCG or CCL codes in a particular field.¹⁸ These two codes give the clearest indication that a transaction was for a journal article because one of the two codes must be used when requesting a copy as opposed to requesting a piece. We eliminated unfilled or canceled transactions. We then followed the same methodology to compile 60,179 transactions from Clio for the period of July 1997 to January 1999.

While the two software packages, SAVEIT and Clio, contain comparable data elements, they have slightly different structures and different field names. To make a single set of transactions for journal articles, we mapped the Clio data to the same format and field names used for SAVEIT data and merged the two data sets. There was some overlap in the data because all requests that were open at the time that ILL migrated from SAVEIT to Clio in June 1997 were carried over. After we identified the duplicates by unique ILL number, we had a total of 43,821 article requests remaining.

Next we combined OCLC numbers from the 3,095 titles Evans canceled between 1990 and 1996 with OCLC numbers in each of the 43,821 transactions records and selected only those transactions on titles having five or more requests over the three year period. This resulted in a set of 506 articles from forty-four canceled titles.

The next step was to determine the cost of each individual borrowing transaction by combining the actual cost of document delivery and copyright clearance with the average local cost per ILL borrowing transaction. This average local cost had been calculated for reporting to the Association of Research Libraries (ARL) ILL/DD Performance Measures Study in 1996.¹⁹ In this ARL study, the mean borrowing cost for a research library was \$18.35. However, TAMU's mean average borrowing cost was \$11.95. For the current study, because we wanted to determine actual document delivery and copyright costs, we removed the average cost for these two factors from the \$11.95

and used \$8.92 as our average cost for staff time, network/communications fees, photocopying, supplies, and equipment. We then added the actual document delivery and copyright costs for each transaction in our study to TAMU's base cost. We then summed the costs for each of the forty-four canceled titles.

We found that Interlibrary Services had added only commercial supplier costs, not charges to borrow from other libraries, to SAVEIT and Clio records. We obtained lending charges for non-reciprocal lenders from that institution's Name Address Directory entry on OCLC. We obtained the copyright charges from either the Copyright Clearance Center in the US, the British Library Document Supply Centre (BLDSC), or the Canadian Institute for Scientific and Technical Information (CISTI).

Finally, we obtained 1999 subscription prices for the canceled publications from Silver Platter's version of *Ulrich's International Periodicals*.

RESULTS

For the 3,095 titles canceled between 1990 and 1996, our research found that articles from only forty-four titles, or 1.4 percent, were requested five or more times between May 1995 and January 1999. Table 1 displays the calculated ILL/DD costs of filling these requests. In the majority of cases, more than three years of borrowing did not approach the cost of a single year's subscription. In fact, only four of the titles had higher ILL costs for the period under study than the probable cost of subscribing for three years. In Table 1, those four titles are bolded. In these cases, it cost TAMU more to satisfy patron needs through ILL/DD than to subscribe to the journals. This does not necessarily mean that the deselection decision was wrong, however, because our analysis does not factor in such other important costs of maintaining a subscription as staff time required for processing and managing the title, binding, and storage.

COMMENTS

The SAVEIT and Clio data included other relevant collection development information that we did not consider pertinent to our specific analysis. For instance, the data would tell a selector whether all requests came from a single or multiple requestors. If a previous cancellation decision were challenged on the basis of high use, selectors would obtain this informa-

Table 1
Five or More Interlibrary Loan Requests for Canceled Journals, April 1995–January 1999

Title	Number of Requests	Lender Charges	Copyright Fees	Subtotal	Borrowing Cost	ILL-DD Total	1999 Subscription Price
1. Agricultural science in Finland	5	\$5.00	\$0.00	\$5.00	\$44.60	\$49.60	\$89.63
2. Alberta journal of educational research	8	\$8.55	\$0.00	\$8.55	\$71.36	\$79.91	\$53.00
3. American journal of physiology: Cell physiology	46	\$167.45	\$75.00	\$242.45	\$410.32	\$652.77	\$425.00
4. Australian journal of plant physiology	36	\$128.37	\$36.00	\$164.37	\$321.12	\$485.49	\$475.00
5. Biochimica et biophysica acta	25	\$9.90	\$195.00	\$204.90	\$223.00	\$427.90	\$10,839.00
6. Biorheology	5	\$0.00	\$0.00	\$0.00	\$44.60	\$44.60	\$751.00
7. Botanica acta	13	\$9.50	\$18.00	\$27.50	\$115.96	\$143.46	\$348.79
8. British journal of guidance & counselling	10	\$0.00	\$0.00	\$0.00	\$89.20	\$89.20	\$308.00
9. British journal of sociology of education	6	\$24.03	\$0.00	\$24.03	\$231.92	\$255.95	\$598.00
10. Bulletin of environmental contamination and toxicology	11	\$0.00	\$8.00	\$8.00	\$98.12	\$106.12	\$556.00
11. Combustion science and technology	7	\$40.00	\$40.00	\$80.00	\$62.44	\$142.44	\$5,832.00
12. Energy policy	7	\$86.82	\$0.00	\$86.82	\$62.44	\$149.26	\$1,049.00
13. European journal of marketing	6	\$0.00	\$0.00	\$0.00	\$44.60	\$44.60	\$6,199.00
14. Fertilizer research	44	\$169.96	\$195.50	\$365.46	\$392.48	\$757.94	\$900.00
15. Holz als Roh- und Werkstoff	5	\$0.00	\$0.00	\$0.00	\$44.60	\$44.60	\$543.90
16. The Indian forester	9	\$0.00	\$11.40	\$11.40	\$80.28	\$91.68	\$50.00
17. International journal of machine tools & manufacture	7	\$0.00	\$0.00	\$0.00	\$62.44	\$62.44	\$1,981.00
18. International journal of neuroscience	8	\$47.25	\$0.00	\$47.25	\$71.36	\$118.61	\$5,682.00
19. The Journal of adhesion	5	\$115.65	\$0.00	\$115.65	\$44.60	\$160.25	\$3,900.00
20. The Journal of resource management and technology	23	\$189.00	\$0.00	\$189.00	\$205.16	\$394.16	\$150.00
21. Journal of Russian and East European psychology	5	\$0.00	\$0.00	\$0.00	\$44.60	\$44.60	\$738.00
22. Journal of divorce & remarriage	14	\$0.00	\$11.40	\$11.40	\$124.88	\$136.28	\$325.00
23. Journal of forensic sciences	5	\$0.00	\$0.00	\$0.00	\$44.60	\$44.60	\$129.00
24. Journal of high resolution chromatography: HRC	7	\$112.86	\$0.00	\$112.86	\$62.44	\$175.30	\$431.63
25. Journal of police science and administration	9	\$0.00	\$0.00	\$0.00	\$80.28	\$80.28	\$50.00
26. Journal of the Chemical Society of Pakistan	13	\$94.15	\$0.00	\$94.15	\$115.96	\$210.11	\$30.00
27. Leadership & organization development journal	5	\$12.00	\$0.00	\$12.00	\$44.60	\$56.60	\$6,599.00
28. Libri	8	\$22.30	\$0.00	\$22.30	\$71.36	\$93.66	\$216.90
29. Memoria - Sociedad de Ciencias Naturales La Salle	5	\$5.00	\$0.00	\$5.00	\$44.60	\$49.60	\$25.00
30. Mining engineering	6	\$15.73	\$0.00	\$15.73	\$53.52	\$69.25	\$125.00
31. NFPA journal	9	\$78.00	\$0.00	\$78.00	\$80.28	\$158.28	\$95.00
32. Philips journal of research	6	\$22.30	\$0.00	\$22.30	\$53.52	\$75.82	\$277.00
33. The Police chief	8	\$4.75	\$0.00	\$4.75	\$71.36	\$76.11	\$25.00
34. Prevention	13	\$9.50	\$0.00	\$9.50	\$115.96	\$125.46	\$18.94

(Continued)

Table 1 (continued)

Title	Number of Requests	Lender Charges	Copyright Fees	Subtotal	Borrowing Cost	ILL-DD Total	1999 Subscription Price
35. Revista de biologia tropical	6	\$20.66	\$0.00	\$20.66	\$53.52	\$74.18	\$40.00
36. Scanning	7	\$0.00	\$0.00	\$0.00	\$62.44	\$62.44	\$325.00
37. The Scientist	5	\$16.60	\$0.00	\$16.60	\$44.60	\$61.20	\$58.00
38. Social text	13	\$12.00	\$4.56	\$16.56	\$115.96	\$132.52	\$95.00
39. Solvent extraction and ion exchange	8	\$76.00	\$8.72	\$84.72	\$71.36	\$156.08	\$1,050.00
40. Tappi journal	14	\$9.50	\$3.00	\$12.50	\$124.88	\$137.38	\$925.00
41. Video review	22	\$9.75	\$0.00	\$9.75	\$196.24	\$205.99	\$15.97
42. Wildlife Society bulletin	17	\$36.86	\$4.00	\$40.86	\$151.64	\$192.50	\$90.00
43. World review of animal production	6	\$54.00	\$54.00	\$108.00	\$53.52	\$161.52	\$75.00
44. Zeitschrift für physikalische Chemie	9	\$81.00	\$81.00	\$162.00	\$80.28	\$242.28	\$854.55
Totals	506					\$7,123.02	\$53,344.31

Bold indicates titles for which subscription might be more cost effective than ILL/DD.

tion to facilitate a review of the request to reinstate the title.

The analysis proved to be of great interest to Evans' ILS staff who had at times suggested that it would be more economical to subscribe to a title than to handle multiple ILL requests. The study, however, proved that more often than not, based on a comparison of ILL/DD costs and subscription price, it *is* more cost effective to obtain several articles from a journal than to subscribe to the publication.

PROJECT II: SELECTING TITLES FOR AN ELECTRONIC JOURNAL ARRAY

The first project was relatively easy to conduct using ILL/DD borrowing data. The authors, however, also found another use for the same data. In the summer of 1998, when the University of Michigan and Elsevier issued a call for participation in the Pricing Electronic Access to Knowledge (PEAK) Project, Texas A&M staff used our ILL/DD data to preselect titles for the PEAK electronic journal array.

PEAK PROJECT

PEAK was designed to obtain data about the use patterns of the Elsevier Publishing Group's 1,100 electronic journals in order to test the effectiveness of different pricing structures.²⁰ Michigan and Elsevier randomly placed Evans Library in one of three exper-

imental groups to test different options. An article by Kiernan explained what was taking place.

There are three options for access to 1997 and 1998 issues. One permits a university to purchase electronic subscriptions to the full contents of one or more Elsevier journals. A second choice allows the university to pay up front for access to a specified number of articles anywhere in the PEAK data base. A third option lets the university make no advance purchases but instead order articles as needed, at a higher cost per article; the university can pay for the articles or can require individuals to do so.

Under the terms of the experiment, some universities are given only two of the three choices. A university can also combine the options that are available to it; for example, a university could both purchase a small number of electronic subscriptions and make an advance purchase of a certain number of articles from other journals.²¹

Participating libraries automatically had access to all Elsevier titles to which they already had print subscriptions. However, if they did not subscribe to a given title in either print or electronic format, they could purchase articles from these publications on a case-by-case basis. TAMU's selectors believed that it would be less expensive to pay for electronic access to an entire title than to pay article-by-article if a title were heavily used. Given that Evans Library had allocated only a modest one-time sum to support partici-

pation in PEAK, selectors wanted to be very careful in their choices. They asked whether past ILL/DD requests revealed any heavily used Elsevier titles that would warrant the full cost of a subscription. And it turned out that the SAVEIT and Clio data did in fact offer concrete information regarding the use of Elsevier titles that the library had canceled or to which it had never subscribed.

METHODOLOGY

Because the same Access database of borrowing transactions from 1995 through 1998 contained imprint information, the character string "Elsevier," as well as a string for other members of the Elsevier group, such as "Butterworth," "North Holland," and "Pergamon," were searchable. Table 2 shows a sample of the titles and related imprint information we retrieved as we did these searches.

RESULTS

In approximately fifteen minutes, our searches retrieved 2,731 transactions for 701 Elsevier titles. The subject selectors used the data to target fifty-four journals that they had confidence TAMU students, faculty, and staff would use. All fifty-four of the targeted titles were then included in the project journal title array. As of November 1998, after only three months of participation in PEAK, forty-three of the fifty-four titles (80 percent) had been used at least once.

COMMENTS

Results from PEAK are proprietary at this time. But researchers at the University of Michigan expect to publish results sometime after the current phase ends on August 31, 1999. Without the SAVEIT and Clio data, our selectors would not have had hard data on which to rely, and instead would have had only their own opinions to use in selecting titles for inclusion in the project.

CONCLUSION

In an age when librarians are held accountable for how they spend limited resources, and when faculty press for many more new subscriptions than a library can afford, interlibrary loan and document delivery data can be used effectively to evaluate requests for additional

subscriptions and to determine which titles are most likely to be cost effective for a library to purchase. ILL/DD operations that have used commercial software are able to provide subject selectors and collection managers with extremely useful data to assist in decision making. Evans' Interlibrary Services has traditionally produced an annual list of frequently requested serials to aid selectors in identifying journals to consider for purchase. Prior to the use of standard ILL software and relational databases, TAMU staff would not have been able to provide selectors with data tailored for specific uses within a reasonable timeframe. Compiling such data manually would have been excruciatingly time-consuming and complicated.

The SAVEIT and Clio ILL software packages and the relational database capabilities of MicroSoft Access greatly enhance Evans Library's ability to respond to complex collection development queries on demand. Because of the data gathering capabilities of SAVEIT and Clio and the ability to use Access queries to get customized reports, staff have been able to address questions that they never anticipated when they purchased the software originally. Now raw ILL/DD data is mounted on the local area network so that staff who are familiar with Access can query the database as needed. Subject selectors expect that further new uses for the data will continue to emerge. The two case studies described serve as a model for other librarians who want to take advantage of ILL/DD data for collection development decisions.

The use of ILL software packages in libraries with integrated library systems begs the question: Should vendors incorporate such software into their system designs? ILL operations depend on data in the local system (e.g. specific holdings information), as well as an interface with a resource database such as OCLC. System vendors usually provide interfaces to bibliographic utilities for acquisitions, cataloging, and authority control purposes. Major integrated library systems, however, do not provide ways to extract useful ILL/DD data, such as that available from SAVEIT and Clio. As libraries move closer to an access over ownership model, this type of interface is all the more desirable because it can help staff streamline ILL procedures as well as collect data for collection management purposes.

Librarians should actively urge vendors to redesign their systems with ILL data capture and analysis in mind. This concept may be facilitated by a broader implementation of the ISO ILL Protocol. According to the Association of Research Libraries North American

Table 2
Sample ILL/DD Requests for Publisher "Elsevier" and Related Entities

Title	Imprint	Volume	Date
Biochimica et biophysica acta	New York : Elsevier Publishing Co.,	1254 :NO: 1	:DATE: 1995 :PAG 1995
Biochimica et biophysica acta. Bioenergetics.	Amsterdam : Elsevier Pub. Co., [c1967–	1275 :NO: 1-2	:DATE: 1996 :PAG 1996
Biochimica et biophysica acta. Bioenergetics.	Amsterdam : Elsevier Pub. Co., [c1967–	1275 :NO: 1-2	:DATE: 1996 :PAG 1996
Biochimica et biophysica acta. Gene structure and	Amsterdam : Elsevier Biomedical Press, 1982–	1259 :NO: -	:DATE: 1995 :PAG 1995
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1217 :NO:	:DATE: 1994 :PAG 1994
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1233 :NO: 2	:DATE: Feb. 15, 1995 :PAG Feb. 15, 1995
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	428 :NO: 3	:DATE: 1976 :PAG 1976
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1316 :NO: 2	:DATE: 1996 :PAG 1996
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1259 :NO: 3	:DATE: 1995 :PAG 1995
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1298 :NO:	:DATE: 1996 :PAG 1996
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1302 :NO: 3	:DATE: 1996 :PAG 1996
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1212 :NO: 1	:DATE: 1994 :PAG 1994
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1254 :NO: 2	:DATE: 1995 :PAG 1995
Biochimica et biophysica acta. International Journ	Amsterdam [etc.] Elsevier/North Holland [etc.]	1244 :NO:	:DATE: 1995 :PAG 1995
Biofilm reactors: selected proceedings of the IAW	Oxford [England]; Tarrytown, New York: Pergamon	20 :NO: 10-11	:DATE: 1993 :PAG 1993
Biological psychiatry.	[New York] Elsevier [etc.]	35 :NO:	:DATE: 1994 :PAG 1994
Biological psychiatry.	[New York] Elsevier [etc.]	35 :NO: -	:DATE: 1994 :PAG 1994
Biological psychiatry.	[New York] Elsevier [etc.]	7 :NO: 2	:DATE: 1973 :PAG 1973
Biological psychiatry.	[New York] Elsevier [etc.]	33 :NO: 11/12	:DATE: June 1993 :PAG June 1993
Biological psychiatry.	[New York] Elsevier [etc.]	37 :NO: 1	:DATE: Jan 1995 :PAG Jan 1995
Biological psychiatry.	[New York] Elsevier [etc.]	39 :NO: 1	:DATE: 1996 :PAG 1996
Biometeorology: proceedings of the . . . Internation	Oxford; New York: Symposium Publications Division	35? :NO: 3	:DATE: 1991 :PAG 1991
Biorheology.	[Oxford, Elmsford, N.Y.] Pergamon Press	131 :NO: 1	:DATE: 1994 :PAG 1994
Biorheology.	[Oxford, Elmsford, N.Y.] Pergamon Press	131 :NO: 1	:DATE: 1994 :PAG 1994

Interlibrary Loan and Document Delivery (NAILDD) Project “as of April 1, 1999 over 40 organizations and projects have committed to implement the international standard for ILL communication—the ISL ILL Protocol (10160 & 10161).”²² Like electronic data interchange in acquisitions, the ILL Protocol standardizes ILL/DD messages for electronic interchange between borrowing and lending organizations and vendors. When integrated system vendors support this ISO standard, then most interlibrary loan and document delivery operations will no longer need to purchase separate ILL/DD management software. The result should be a powerful collection analysis tool that combines both circulation and ILL/DD data to produce a more complete picture of collection use.

NOTES

1. Doris E. New and Retha Stone Ott, “Interlibrary Loan Analysis as a Collection Development Tool,” *Library Resources & Technical Services* 18 (1974): 275–83.
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