

Bottoming Out the Bottomless Pit with the Journal Usage/Cost Relational Index

Carole Francq

ABSTRACT. What serials should be cancelled and what is a systematic way to do it? The Usage/Cost Relational Index identifies low-use journals and ranks the titles in relation to their subscription cost. The Index has a simple formula easy for librarians to apply and explain to inquisitive faculty. The Index Numbers are calculated on a spreadsheet that can receive subscription and use statistics by importing electronic data files in ASCII format.

The Index is individual for each library and flexible in the usage data needed for the study. Use statistics may include interlibrary loan activity, exclude in-house use or have other data quirks. It is important for the manager to be aware of what the usage figures represent. Use studies can be time-consuming and, therefore, expensive, but their costs can be recovered in the cancellation process.

INTRODUCTION

While periodical price escalation has librarians studying the pricing behavior of publishers, parent institutions of libraries are beginning to see collection funds as a bottomless pit. Libraries don't have the dollars to add new journals and pay escalating subscription prices. Actually, librarians have no alternative but to look at other

Carole Francq is Director of Collection Management at the Ruth Lilly Medical Library of the Indiana University School of Medicine. She received her MLS from Emporia State University. She recently has been awarded three grants for cooperative collection development and automation.

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options whereby change might sweep the world of scholarly publishing. Major change could come from the universities which are already investing in information technology that makes it increasingly financially attractive for universities to play a more direct role in the creation, publication, review, and distribution of information (Dougherty, 1988).

As scholars move to new paradigms, librarians can better measure and evaluate one of their traditional responses to increased journal costs, namely, subscription cancellations. At the Indiana University Ruth Lilly Medical Library in Indianapolis, the cancellation process was made easier by an effective, new tool, the Usage/Cost Relational Index (UCRI), developed in and used since 1992.

The Index number is created by dividing the current subscription cost for each journal by the number of uses the journal receives over a period of time. The division results in a quotient, the Usage/Cost Relational Index Number. The Index Numbers are sorted on the spreadsheet which creates the ranking of titles from the most to the least costly based on their use.

The Index Numbers are not cost-per-use figures, which would require a full year's subscription and use data for every year in the study. The UCRI Number is relative and allows for flexibility in the data needed. Libraries of all types and sizes can adjust the application to their own situation. For example, a librarian might elect to do the use study over the most recent two years of journals on the current reading shelves, or only those years published since barcoding began at the library. The choice of publication years can be selected for the convenience of the library.

According to James Neal, current President of the Library Administration and Management Association, "Accountability and productivity are the buzzwords of the current economic environment. The ability to measure, evaluate, and communicate the results of analysis is increasingly important. Guidelines and tools are critical to effective data collection and presentation" (Neal, 1993). The most successful librarians of the future will plan from solid and consistent statistics programs such as a Usage/Cost Relational Index yearly study.

DESIGNING THE PROJECT

The object is to have a column of each current subscription title, aligned with columns of subscription costs and journal use in a computerized spreadsheet. In addition, each journal title will be associated with a unique number such as a vendor's title number or an ISSN. The spreadsheet divides the subscription cost by the number of uses to give a quotient. The spreadsheet can instantly sort the quotient column into ranked order (see Figures 1 and 2).

The ranking becomes a list of subscriptions that provide the least to the greatest economic value in terms of journal use related to subscription cost. The number merely ranks a title in comparison to other titles. The number is not a cost-per-use figure as in a recent four-year study that found 20.5 percent of 5,800 serials had a cost-per-use higher than \$14, the average expense of an interlibrary loan (Milne, 1991). Unlike the Milne project which required a full year's subscription and use data for every year in the study, the Usage-Cost Relational Index numbers could be derived from much less input of data. It is the ranking that makes this list invaluable. The list becomes a tool for the selection manager. The extreme ends of the list show the poorest and best dollar values.

SELECTION CRITERIA

The list compares only use and cost. It then becomes the collection manager's responsibility to add other criteria to the deselection process. Some other criteria are: curricular needs, indexing, other similar sources of information, local availability, local contributors, language, impact factor. An in-depth discussion of the selection process for journals and a discussion of criteria can be found in *Guidelines for Collection Development* by the American Library Association (1979), and Marcia Tuttle's *Introduction to Serials Management* (1983). Criteria for deselection and a generic serials review project plan is in Richards and Prelec's chapter, "Serials Cancellation Projects: Necessary Evil or Collection Assessment Opportunity?" (1992). This chapter is brief, well-written, and covers the history of collection assessment, reasons for assessment, and

FIGURE 1

RUTH LILLY MEDICAL LIBRARY 1992 Usage Study Subscription Cost

Faxon Title #	Name of Periodical	One-Year Subscription Cost	Current Usage	Usage/ Cost
255591	Brain Research	6,750.00	271	24.91
032336	Biochimica et Biophysica Acta	5,385.14	110	48.96
052796	Journal of Comparative Neurology	4,910.00	108	45.46
016295	Journal of Chromatography	4,421.28	94	47.03
038886	Comparative Biochemistry and Physiology	4,096.00	9	455.11
060896	Mutation Research	3,132.17	41	76.39
344102	European Journal of Pharmacology	3,099.00	120	25.83
009784	FEBS Letters	2,609.40	236	11.06
088474	Neuroscience	2,552.00	99	25.78
057839	Gene	2,490.59	96	25.94
TOTALS:		\$39,445.58	1184	\$33.32

FIGURE 2

RUTH LILLY MEDICAL LIBRARY
1992 Usage Study
Usage/Cost Relation Quotient

Faxon Title #	Name of Periodical	One-Year Subscription Cost	Current Usage	Usage/ Cost
038886	Comparative Biochemistry and Physiology	4,096.00	9	455.11
060896	Mutation Research	3,132.17	41	76.39
032336	Biochimica et Biophysica Acta	5,385.14	110	48.96
016295	Journal of Chromatography	4,421.28	94	47.03
052796	Journal of Comparative Neurology	4,910.00	108	45.46
057839	Gene	2,490.59	96	25.94
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088474	Neuroscience	2,552.00	99	25.78
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TOTALS:		\$39,445.58	1184	\$33.32

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the two recent conflicting points of view on access verses ownership. The chapter gives the extent of journal cancellations and criteria of 125 libraries serving U.S. medical schools and found that over a five-year period journals were cancelled because of low use (66%), subscription cost (49%), diminished need (29%), duplicate subscription (27%), not indexed (25%), and language or geographic origin (23%). The two-page generic serials review project plan is an outline of goals, guidelines, criteria for review, methodology and outcome statement, which can be adopted by most libraries.

USE STUDIES

In order to generate a Usage/Cost Relational Index, the manager must first locate usage statistics for journal titles that can be downloaded into a spreadsheet. If use statistics are unavailable, a use study must be planned.

The use statistics can cover a full year or just a sample portion of a year. Full year studies may be either calendar or fiscal year. Subscriptions are usually paid by calendar year, limiting most cost-per-use studies to that time period. The Usage Cost Relational Index will accommodate any time-period design: calendar year, fiscal year, portion of a year or multiple years.

If the library's fiscal year ends in June, then a practical usage count would begin in July and end in June the following year. To avoid incidental date skewing, the study should cover the most recent year-and-a-half to two-and-a-half years of publication. Here is an example of a usage study designed on a July-June fiscal year beginning with the most recent year-and-a-half of publication:

Usage Data Collected Over Time Period of	Publication Years Counted
July 1992-June 1993	1991, 1992, Jan-June/1993

Some journals, particularly quarterlies and annuals, will be disadvantaged by their lateness of receipt in the library. Before final cancellation decisions are made, the librarian must go to the shelves and examine each potential cancellation title for individual peculiarities.

SUBSCRIPTION DATA DOWNLOAD TO SPREADSHEET

After determining the usage study design, the manager must incorporate the subscription data into a spreadsheet. This could be a simple and inexpensive process.

Most subscription vendors today offer financial data for a year in ASCII format on floppy disk. ASCII format is one of the standard formats for representing characters in electronic text files. It is a standard format for the export and import of electronic files between computer programs and other sources such as barcode scanners and electronic mail. With a few hours of planning and experimenting with a subscription vendor's demonstration disk, Ruth Lilly Medical Library staff downloaded subscription financial data in ASCII into a Quattro Pro spreadsheet.

A library with more than one major subscription vendor could use this same method, assuming each vendor could supply the data in ASCII format on a floppy disk. The same download procedure should be possible with spreadsheets other than Quattro Pro. Staff should be involved in selecting an appropriate spreadsheet that is familiar to them. Once a manager has the major concept in mind, i.e., a spreadsheet with usage statistics and financial data in electronic form, ideas can be presented with clarity to staff, vendor representatives, administrators and others who will help the idea become reality.

PRICELESS USAGE COUNTS

Valid reshelving counts rely on having staff, rather than customers, reshelve materials after use. With well-placed signs and convenient areas for leaving books, librarians have successfully changed customer's habits of reshelving volumes themselves to allowing staff to reshelve used materials. The reshelving that continues to be done by over-zealous customers did not adversely affect the overall outcome of usage studies done by the Ruth Lilly Medical Library. Cancellation of a low-usage journal is rarely followed by a customer complaining that he always reshelves volumes after use. If a valid complaint occurs, a manager can always revise his or her decision.

Reshelving counts can be recorded with barcode scanners that collect data in ASCII format for downloading. The scanning method requires that the journals be barcoded, or that a barcode be mounted on the shelf for each title, or that a Rolodex with journal titles and barcodes be next to the sorting area(s) as journals are reshelved.

Barcode scanning can be done with portable barcode readers in the stacks as volumes are reshelved. The barcodes can be mounted either in the volumes or on the shelf in a platen. Scanning also can be done in a central location. For example, the journals can be trucked to the circulation desks for reading by desk scanners before they are trucked for reshelving. Perhaps an automated circulation system is already supplying appropriate usage figures; however, at this time, no system with circulation and acquisitions components combine the information to generate a usage cost relational report.

A manual usage count requires staff to record each reshelving of bound and unbound journals for a given period of time, and tally the marks at the end of the study. During the 1992-1993 manual count at the Ruth Lilly Medical Library, 96 of 1830 subscriptions were cancelled due to documented low use. The 96 dropped titles amounted to \$31,780 in subscription savings which will be continued year after year. The use study added approximately five seconds to each of the 317,557 journal reshelvings in fiscal year 1992/93, amounting to 441 staff hours at the cost in wages of \$2,205.

DATA QUIRKS

It is important for the manager to be aware of what the use figures represent. Data can be influenced by a variety of factors, i.e., the exclusion of in-house use, interlibrary services, target audiences or disciplines, and time of the school year.

In the case of libraries that check out journals and have automated systems, a count can be taken from automated circulation statistics. To make the results complete, the in-house use would need to be added for each journal title. It might be worth the time to run a sample of in-house use to determine if this makes a significant difference when combined with automated circulation statistics. Either way, automated-use figures could be input or downloaded into the spreadsheet next to the subscription information.

Is interlibrary loan activity counted in use statistics? Even if the use figure is coupled with interlibrary service activity, the tally remains valuable and probably represents more information than previously known. An analysis of the impact of interlibrary loan use on collection management and cancellation decisions is provided by Bleker (1990) who analyzed 60,779 external interlibrary loan requests for periodical articles and 4,157 internal requests for articles from periodicals not owned by the Erasmus University Medical Library. He found that over 50% of the requests were for the most recent two-year period, and 90% of the requests could be filled with a twenty-year run of periodicals. Bleker's computerized list of journal activity gave collection managers information on the number of times a title was used by interlibrary loan and unique identifier codes for the requestors. A manager should know for whom he is buying subscriptions which is not always clear unless interlibrary services are analyzed.

Large libraries could target certain disciplines, or branch libraries, as a place to begin if no recent use studies exist. Perhaps the staff most determined or desperate for a solution to their escalating subscription costs could be supplied the support for a use study.

Usage data gathered over a full year will be more reliable than that which covers a shorter period. Certain classes are taught every other semester which could affect a journal usage study done over a period of two to three weeks or months. Faculty members' research time may be scheduled during one particular part of the year which might be missed in a brief study. For methods and types of use studies and collection evaluation information, *Collection Management for the 1990's* (1993) is a good source from the American Library Association. Millson-Martula (1988) and, also, Broadus (1985) have published reviews on use studies. Each of these sources explains research methods and techniques for objective measurements that are reliable, referring to the researcher's ability to generalize from a sample to an entire population, and valid, referring to the accuracy of researcher's conclusions. The applications described should be carefully selected to fit a local situation.

Gift titles will be excluded from a UCRI study because they have no subscription price. However, gift journals should still be included in the usage study because exclusions are difficult for staff to man-

age. Furthermore, low-use gift titles may not be worth the trouble required to process and maintain, so a use study could be helpful.

If a full year's count is too unmanageable, a librarian can use a sample period of time. The time period chosen must be representative of regular library patterns. The bindery schedule should be taken into consideration during a short study. A sample study is better than no study of use because it permits the manager to calculate the Index figures and to have a system to identify titles for possible cancellation.

Any time period is acceptable to the formula of the Usage/Cost Relational Index. Of course, the more reliable the data put into the formula, the more reliable the resulting Index numbers. A full year's count is, therefore, strongly recommended.

The UCRI data-gathering process was found invaluable when facing tough budget decisions and faculty discussions. Whether or not a collection manager must seek faculty counsel before acting on subscription cancellations, managers want reliable data upon which to base their decisions.

CHOICE OF RANGE OF PUBLICATION YEARS

The Usage/Cost Relational Index allows for a choice of publication year(s) to be compared to the latest full-year subscription cost. Unlike a cost-per-use figure which would require full usage and subscription costs per each publication year in the study, the Usage/Cost Relational Index merely relates usage to cost. The relational concept allows the flexibility each library needs to apply the formula with ease to its own situation.

The publication years chosen for the usage count should be determined according to the availability of staff time, yet represent enough years for a sound study. If only usage during the latest publication year is counted, many issues will not be received in the library during the stated year of publication. Most managers would base a decision to maintain a journal's subscription on use of the issues of the journal's last two publication years, not on use of volumes from the 1950's. Limiting the years studied greatly reduces staff time on the study.

The question arises whether newly received, unbound issues

should be included in the study. New issues are heavily used and therefore should be included. New issues in some libraries are placed on special reading shelves where readers are usually encouraged to reshelve after use. Special shelves for new issues are sometimes separated from the bound volumes of the title. Barcoding each new issue before binding is very labor intensive, and could delay getting issues out to the readers. Taking new issues to a central barcode scanning location would be labor intensive and may cause delays and customer dissatisfaction. These considerations will differ among libraries, and are valid reasons offered for excluding current issues from a usage study.

Current issues are most easily accommodated in use studies in which bound and unbound issues are shelved together. In this case, a single barcode could be mounted on the shelf holding the journal. The barcode could represent only the new, unbound issues of that title, or according to the project design, the barcode could represent all bound and unbound issues of the entire title. An alternative method is to have barcodes mounted on a Rolodex in a central location. This method also could have the barcode designed to represent either of the two choices previously described. Either way, new issues can be included in the count with little to no special handling if current issues are shelved with bound volumes.

When one barcode represents all issues, bound and unbound, of a journal title, shelvees can be instructed to scan the barcode only when shelving the last two years of a title. This directive would save the shelvees work, and the manager would have usage figures from the most pertinent years of each title. The design of the usage count is quite discretionary, and should be carefully thought out to conserve staff time and resources. The Usage/Cost Relational Index is a relational number and can be used with any configuration of publication year(s) as long as the range of publication years are the same for all titles in the study.

SELECTING BARCODE SCANNING EQUIPMENT

If an automated use study is being designed, it is important to gain expertise in barcode scanning. Choosing the right scanning equipment for the application keeps people focused on their pri-

mary tasks instead of concentrating on the barcode system. Some barcode scanners are capable of exporting data in ASCII format to spreadsheets.

Kevin Sharp, technical editor for *IDSystems*, reviews the technologies to be considered before selecting handheld scanners. He explains in layman's terms the resolution, light source, scan distance, and packaging of scanners which are characteristics critical to the success of a system. The smallest element that a scanner can see is its resolution. Too great a resolution can pick up insignificant printing defects and distort the outcome. Light sources currently on the market are visible and infrared, and Sharp advises to select the visible light sources when possible because the light can be seen when operating. Infrared can more reliably read through some laminates, oils, and dirt better than visible devices. Some scanners work from a distance and some require contact with the barcode. In a dirty or dusty environment a wand scanner that requires contact may scratch or smudge barcodes. To read barcodes from an awkward position or from a distance, Sharp would use a non-contact laser scanner. The packaging of scanners determines their ruggedness, influences the first-time read rates, and may or may not have built-in decoding and communication devices which greatly affect the weight of the device. When considering packaging it is important to think about whether employees will hold or carry objects being scanned and the number of scans to be made in a day. If many scans are to be made in a day, then a scanner that allows for minimum operator movement is important (Sharp, 1993).

An ergonomic checklist for handheld scanners has been developed by Sheila Tolle, a senior market manager for Spectra-Physics Scanning Systems, Inc. She explains about the weight of scanners, balance-meaning where the weight is located, handle shape, holding the scanner between scans, the trigger assembly and general operation. Weight should be as light as possible, and the weight of any necessary cabling should be considered. The weight should be back and down into the handle, and not top-heavy. Scanners with oval handles seem to fit into a hand more comfortably than those that are square. Consider if all the operators have roughly the same size hands. Make sure the scanner is comfortable to hold or easy to put aside between scans. Tolle states that a scanner should have a long

enough trigger-pull distance to minimize accidental scanning and to find out the life expectancy of the trigger spring. She suggests to ask the dealers how the issue of ergonomics was taken into account during development, what tests were performed for ergonomics and what were the results of the tests. She states that ergonomics is as important as any other single factor when selecting a barcode scanner (Tolle, 1993). At the Ruth Lilly Medical Library demonstration models were brought in for employees to try before purchase agreements were made.

When planning a project, a manager will need the barcode specifications such as dense code 39 (9.4 characters per inch). Basic features to look for in a scanner are a standard RS-232 serial interface, ASCII data transfer, simple programming capability and probably minimal 256K memory.

SUMMARY

The Usage/Cost Relational Index identifies low-use journals and ranks the titles in relation to their subscription cost. The Index then becomes a tool for journal collection managers to locate titles for cancellation based on low use in relation to subscription cost. The calculations are done on a spreadsheet that can receive subscription and use statistics by importing electronic data files in ASCII format.

Use figures may include interlibrary service activity, exclude in-house use or have other data quirks. It is important for the manager to be aware of what the use figures represent. Use counts can be time-consuming and, therefore, expensive, but their costs can be recovered in the cancellation process.

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