Serial Cuts vs. Public Service: A Formula

A formula, based on access time, measures the effect of serials budget reduction on public service. It provides librarians with sound justification for major budget cuts.

Serials are the single most important source of current information in science and technology libraries. Recently as serials prices have increased from 10 to 15 percent annually and library allocations have often remained static or been decreased, librarians have continued subscriptions even as the share of money left unencumbered slipped into negative numbers. Most librarians who have enjoyed years of expanding collections and increasing materials allocations have not adequately developed techniques for cutting budgets in the face of inflation and reduced funding.

Those who have been forced to make reductions in subscription lists may make budget cuts on the basis of intuition, choosing titles which they feel are not being used. Others generalize on the basis of price which titles should be of most importance to users, that is, low-cost titles are most popular and least likely to be used in advanced research, and high-priced titles are important in international publications. Still others have forced faculty members to make the decision after indicating that no books can be purchased if serials are not reduced.

In 1975 the Engineering-Transportation Library at the University of Michigan faced just such a budget crisis. The average serial title cost $34.80. The overall cost of serials has risen 75 percent in four years and threatened to usurp the total materials allocation. Although it was easy to draw up elaborate lists of titles receiving zero, one, or two uses and contemplate canceling these titles, the judgment of where to stop and for what reasons became arbitrary. What was highly desirable was a way to view the cost of the titles balanced against potential public service cuts. What, for example, would be the effect on our public service of a 20 percent, or even 50 percent, reduction in the budget for serials subscriptions?

After making a detailed analysis of serials use in the library, we have developed a formula which allows for well-advised cuts in the serials budget without serious damage to service.

**Method**

Since September 1974 we have recorded the use of 1,200 current unbound titles and some 1,600 bound titles. All circulations were tallied by title as were all journals cleared from in-building use. While this is not completely accurate as a count of total journal use since some users scan the shelves and replace titles or pick up unshelved journals from sofas and tables, the data reported here have been collected over an eight-month period so that all titles are as-
sumed to have received fair use.

During this period the 1,200 current titles received 16,585 uses (or 13.8 uses per unbound title), although 302 titles received 0 uses (25 percent of our unbound titles). Bound use accounted for 10,181 uses (40 percent of use was bound, 60 percent unbound), and their use reduced the titles which received 0 use from 302 to 174 titles.

Since journals circulate only for one day from our library and most are used in the library and photocopied (about 5,000 pages per month), a journal request can usually be satisfied within five minutes. Two titles requested per day are not owned and, if pursued, would need to be requested through interlibrary loan.

This service might be as quick as a photocopy from a nearby university with two-to-three-day service, or a five-day wait from the Center for Research Libraries (CRL), or a ten-to-twelve-day wait from the British Library Lending Division at Boston Spa. Since CRL has recently announced its intention to be able to supply most titles in social science and science and technology areas since 1970, we can expect a powerful backup resource to help us.5 We shall therefore consider five days (7,200 minutes) to be the average waiting period for titles which can not be supplied locally.

\[
\frac{[26,766 - (1N_1 + 2N_2 + 3N_3 + \ldots + iN_i)] 5 + [480 + (1N_1 + 2N_2 + 3N_3 + \ldots + iN_i)]}{26,766 + 480} = \frac{7,200}{26,766 + 480} = \text{average no. of minutes to service a request}
\]

\[
26,766 = \text{total serials use supplied in library}
\]

\[
5 = \text{no. of minutes to service in-library request}
\]

\[
480 = \text{no. of requests referred outside library}
\]

\[
7,200 = \text{no. of minutes required to service requests outside library}
\]

\[
1N_1 = \text{no. of titles receiving 1 use } \times 1 \text{ use}
\]

\[
2N_2 = \text{no. of titles receiving 2 uses } \times 2 \text{ uses}
\]

\[
\ldots
\]

\[
iN_i = \text{no. of titles receiving } i \text{ uses } \times i \text{ uses}
\]

Fig. 1

The Formula and Explanation

FORMULA AND RESULTS

With the data collected at Michigan in 1974–75 we can express the average number of minutes required to service a journal request as shown in Figure 1.

Table 1 shows the number of titles which received zero to fifteen uses, the cost of these titles (and the number which were free subscriptions), the amount of budget reduction at each step from the $32,250 serials budget for the 1,200 titles studied, the number of minutes to service a request, and the percent of unsatisfied demand when the formula is applied. The formula is used to derive the number of minutes to service a request as a function of the number of titles cut.

Prior to any cancellations and with use of the formula, an average time of 131.75 minutes is required to service each of the total number of serials which were requested; this figure is used as a base point. For each subscription canceled the average five-minute retrieval time is subtracted from 26,766, and the title is added to the retrieval time for titles not in our collection. Dividing the total demand (26,766 + 480) into the requests which cannot be serviced with each cut gives the percent of unsatisfied demand.

Of course, there are many titles that receive no use at all (those which can
be recorded as $ON_0$ in the formula shown in Figure 1); they can be cut without causing a reduction in service. For instance, in our library we can cut 174 titles with no change in service time.

Using the data in Table 1 we can work the following example, shown as Figure 2, illustrating what happens if titles receiving one and two uses are cut. Note that before the cuts we could not service 2 percent of the serial demand.

After the cuts, the unsatisfied demand was 3 percent so that we have actually reduced our current service by 1 percent and saved $7,301.

Figure 3 shows the data when plotted. When the service reduction of 8 percent is implemented, we have reduced our current service by 6 percent, eliminated the free subscriptions in each category, and cut 50 percent of our paid subscriptions ($16,285). The curve which re-

\[
[26,766 - (1\times87 + 2\times85)]5 + [480 + (1\times87 + 2\times85)]7,200 = 199.62 \text{ minutes to service request}
\]

\[
480 + 87 + 170 \div (26,766 + 480) = 3\% \text{ unsatisfied demand}
\]

**Fig. 2**

Elimination of Titles Receiving One and Two Uses
sults from this formula indicates that, even if all serial subscriptions were cut, we could satisfy 40 percent of the serial demand from our bound journal collection. The part of the curve drawn between the plotted data and the 60 percent unsatisfied demand is simply drawn as a smooth extrapolation of the plotted data.

The formula is actually “over fair” since it assumes that any titles cut would have no back issues available either so that no user could be satisfied for a dropped title. Since, in fact, we shall continue to hold all bound volumes, especially during the next few years when the run would be almost current, fewer actual requests from CRL will need to be made.

Continuing compilation of use data has tended to confirm the patterns established in the 1974–75 study. After presenting to the faculty the list of titles which would be cut and the formula by which the decisions had been made, we received very limited concern for indi-
vidual titles. We have, therefore, based on the formula, implemented serials cuts in 1976 to the level of 5 percent service reduction ($11,239 savings). We shall continue to compile use data, account for all interlibrary loans, and tabulate user complaints which may be generated in an effort to measure the effectiveness of our approach.

SOME GENERALIZATIONS

This set of data is specific to Michigan and peculiar to the College of Engineering which we serve. Some generalizations about the use of our titles, however, may prove useful to others.

Little-Used Material

This material can be generally grouped in the following three categories:

Free titles: Of 193 current free titles, 190 of them received fifteen or fewer uses, and 102 received zero use. Many of these titles are in foreign languages or are gifts from American corporations, societies, universities, or research groups.

Foreign titles: Foreign-language titles accounted for 10 percent of the budget and 1.5 percent of the use. Fifty-six German titles received 273 uses, while twenty-two French titles received 31 uses, and thirty-eight Russian titles received 37 uses.

Translation titles: Requiring 22 percent of the budget, these forty-seven titles, mainly translations from Russian, received 1.6 percent of the use.

Heavily Used Material

This material showed considerable difference in user intent since current use often reflected casual browsing, and bound use reflected scholarly purpose. In both cases, however, heavy demand can be supplied by very few titles.

Current title use: 50 percent of our current journal use can be supplied by twenty-five titles. The cost of these popular journals is $485, or .7 percent of the budget. These titles included browsing materials such as Aviation Week, Audio, Car and Driver, Yachting, and Popular Electronics, along with research titles, such as Computing Surveys and the Journal of the Water Pollution Control Federation.

Bound journal use: As Gordon Williams and Derek de Solla Price have pointed out, a small group of titles will serve most research needs. In our study 160 of the 1,600 bound titles supplied 80 percent of the user need. Most heavily used were Computing Surveys, Journal of the Water Pollution Control Federation, Industrial & Engineering Chemistry, Hydrocarbon Processing, and Communications of the ACM.

CONCLUSION

As librarians enter into cooperative agreements and increasing reliance on networks while their budgets do not keep pace with inflation, they will move from considering size of collection and acquisitions locally available to calculating the amount of time required to access huge quantities of information from other facilities. They must concurrently develop tools for measuring cost-effectiveness of the materials they buy and continuously evaluate by sound methods the utility of the library collection they are building. The serials formula developed here provides one such measure.

REFERENCES

ON OUR COVER

A leader among the great public universities that have come to dominate the scene in higher education, Wisconsin opened in 1900 a building that symbolizes to an extraordinary extent both its own scholarly folklore and the Midwestern tradition. Influenced strongly by the neo-classicism of the architecture of the Chicago World’s Fair of 1893, the building reminds later generations of the occasion at that exposition when Frederick Jackson Turner read his paper, "The Significance of the Frontier in American History," an event that served notice to the academic world that new leaders, both individual and institutional, were emerging.

Leading the drive to construct the building were two other American historians, Charles Kendall Adams, president of the university, and Reuben Gold Thwaites, secretary of the State Historical Society and, in 1900, president of the American Library Association. The two institutions shared the new building for many years. The plans that won the architectural competition were the work of Ferry and Clas of Milwaukee. At a cost of $600,000, the original building provided an impressive two-story reading room across the front and space for 413,000 volumes, increased in 1911 to 675,000 with the addition of a second stack wing. Under the administration of Librarian Walter M. Smith, the university library served 1,800 students when the building opened and continued to house both of its occupants until 1954, when the new Memorial Library was opened across the mall.

The original building, expanded by a harmoniously designed addition in the mid-1960s, serves the historical society’s continuing and growing programs in archival and manuscript collection, in museum collections and exhibits, and in publishing. By agreed division of responsibility, the society continues to fill the university’s needs for collections in American history.—W. L. Williamson, Professor, University of Wisconsin-Madison.

Acknowledgment: James Danky, State Historical Society of Wisconsin.

The author gratefully acknowledges the assistance of Stephen Slovasky and Grace Miller in the preparation of this series of issue covers.
FOREIGN & DOMESTIC SERIALS

SUBSCRIPTION SERVICE TO ALL TYPES & SIZES OF LIBRARIES FROM 14 REGIONAL OFFICES IN THE U.S.A., CANADA, EUROPE AND SOUTH AMERICA

COMPREHENSIVENESS

EBSCO services periodicals, newspapers, annuals, yearbooks, irregular book/monographic series (numbered or unnumbered), and continuations. Our computerized price file lists over 100,000 titles. However, we gladly research any title ordered and do not expect the customer to provide publisher name and address. Our research cycle is thorough and provides a quick answer if we are unable to identify the publisher. We service titles from all nations of the world. The only titles we cannot (normally) service for you are order-direct by the publisher’s requirement. (However, if you are a librarian who desires to place 100 per cent of all serials with a single agency, we can handle even the order-direct publishers for you.)

FLEXIBILITY

We believe what we do for you and how we do it should be determined by your needs. We have suggested procedures and formats. Our order processing and records are computerized, and we are able to employ our computer to service any special requests you may have. In the event you have a request which a computer, for some reason, cannot honor, we keep our typewriters handy and a perfect willingness to do whatever is necessary to suit your needs.

PERSONALIZED SERVICE

Our network of 14 regional offices headed by General Managers with experience and authority to act guarantees you responsiveness. Our 14 Managers have 181 years’ experience among them in servicing libraries with serial subscriptions. Order control is located at our regional office. The Manager who commits is the Manager who controls. Each of our customers is assigned to one Customer Service representative, so there is consistency in communications.

WRITE OR PHONE TODAY

EBSCO SUBSCRIPTION SERVICES

826 South Northwest Highway
Barrington, IL 60010
(312) 381-2190

P.O. Box 2543
Birmingham, AL 35202
(205) 252-9010

161 Forbes Road
Braintree, MA 02184
(617) 843-2383

840 Malcolm Road Suite 260
Burlington, CA, 94010
(415) 697-6826

616 Carillon Tower West
Dallas, TX 75240
(214) 387-2426

Suite 110-B
Diamond Hill Complex
2480 W. 26th Ave.
Denver, CO 80211
(303) 439-3235

P.O. Box 9290
Los Angeles, CA 90009
(213) 772-2381

EBSCO Building
Red Bank, NJ 07701
(201) 741-4300

Suite 204
8000 Forbes Place
Springfield, VA 22151
(703) 321-9630 / 321-7494

17-19 Washington Ave.
Tenafly, NJ 07670
(201) 569-2500

Six Thorncliffe Park Drive
Toronto, Canada M4H 1H3
(416) 421-9000

Foreign Direct Office
Box 1081
Birmingham, AL, 35201
(205) 942-3970

Libris-EBSCO Ltda.,
Rua do Rosario, 172-2. Andar
C.P. 65,000 ZC 21
20.000 Rio de Janeiro, Brasil
252-1421 or 252-6767

P.O. Box 3013
Nieuwveen
Holland
017238765

division of
Statistical Mechanics and Its Chemical Applications
by M. H. EVERDELL

"Suitable for advanced or honors undergraduates in physical chemistry, Everdell's treatment would be a valuable library reference book. He assumes a previous knowledge by the student of chemical thermodynamics, and shows how thermodynamic quantities can be calculated from a knowledge of the properties of the atoms and molecules of which a chemical substance is composed. The approach is not highly mathematical and formal but is, instead, presented on a more intuitive chemical level."—Choice, August 1976

1975, 305 pp., $19.50/£7.50
ISBN: 0-12-244450-7

Physical Chemistry: AN ADVANCED TREATISE
edited by HENRY EYRING, DOUGLAS HENDERSON, and WILHELM JOST
VOLUME XIA: Mathematical Methods
by DOUGLAS HENDERSON

"This volume of the Advanced Treatise attempts a survey of the mathematical principles and methods useful in physical chemistry. As a survey, it is quite successful. . . . In spite of the fact that each chapter is written by a different author, an attempt has been made to regularize both writing style and level of presentation. Each topic is covered in a readable, logical manner making the material accessible to even senior level chemistry students.

"The most useful qualities of this volume are its breadth and level of coverage. Most mathematical methods important to physical chemistry are treated. . . .

"It is a genuine pleasure to find material written about mathematical methods presented from such an applied point of view. The material is clearly explained, reinforced with examples, and totally usable by the reader. This book is a welcome addition to a field cluttered with opaque explanations and generally poor writing."—Journal of the American Chemical Society, November 26, 1975

1975, 564 pp., $49.50/£30.20; subscription price, $42.25
ISBN: 0-12-245611-4

Kinetics of Enzyme Mechanisms
by J. TZE-FEI WONG

"A good contribution to the literature on enzyme kinetics that will be useful for researchers, graduate students, and senior undergraduates in biochemistry. Wong provides a nice emphasis on the techniques useful in the solution of kinetic problems. There is a chapter on graphical methods as well as another on statistical methods, and this attention to practical-problem solving pervades the rest of the book. The volume covers the elements of enzyme kinetics and then deals with inhibition and activation, branching and linear mechanisms, cooperative interactions, homotropic mechanisms, isotopic exchanges, and membranes. A useful work."—Choice, April 1976

1975, 294 pp., $20.25/£7.80
ISBN: 0-12-762250-0

Send payment with order and save postage plus 50¢ handling charge. Prices are subject to change without notice.