

Costs and Benefits of Library Information : The User Point of View

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IT IS IMPORTANT to recognize the conceptual difference between the value of information itself and the value of the medium by which the information is obtained. This distinction is useful for two reasons: first, the value of information is often nebulous or difficult to ascertain, or both; and, second, by making it explicit that one is comparing information channels one can often avoid these more difficult problems. This is not to say that it is unimportant to understand why information has value; however, once the decision has been made to seek or acquire information, it is possible to determine independently which channel or channels to use in the process.

For the decision-maker, information has value because it may enable a better decision to be made.¹ This is true both for the manager seeking information about potential markets, competitors, etc., and for the consumer planning a major purchase. On the other hand, some information is valued as a final product, a commodity to be consumed. Examples here might include best sellers, biographies, and so on. Certain types of information fall in both categories; for example, art history might be valued for consumption by some and others might use the information to increase their understanding of the market in the paintings of old masters.

CHOICE OF MEDIA: COSTS AND BENEFITS OF LIBRARIES AND OTHER INFORMATION SOURCES

Recently increasing attention has been paid to the emergence of competitors to both public and special libraries.² For example, Kalba discussed

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special interest magazines, on-line retrieval services, and information brokers as competitors to libraries.³ A more traditional view is represented by the recent studies of the pricing and use of individual and library copies of journals.⁴ Each of these studies highlighted the fact that the library is but one of several possible channels by which a seeker might obtain the desired information. In view of the existence of the alternate channels and the fact that consumers are, to a significant degree, rational in choosing among competing sources, it is important to examine the costs and benefits associated with each of the feasible alternatives so that one might understand how choices are made.

The existence of libraries and their use by individuals will result in both costs and benefits to society over and above the costs and benefits to the individual user. Some of these costs, such as congestion-induced waiting time, would occur even if the user paid a fee to the library for the services it provides. Others result from the avoidance of a fee-for-service system of operation. Examples of the benefits to society include the systematic creation of depositories of written works and the provision of library services to those who may be unable to pay. The detailed examination of the costs and benefits of library usage that follows considers those "private" costs and benefits directly attributable to the individual's use of a library and ignores many of the broader societal effects. (It is assumed that the library currently exists and that each use does not influence the size or scope of the collection.)

<i>Costs</i>	<i>Borne by</i>
Time, money, effort spent going to the library	User
Delivering item sought to user	Library
Delays in obtaining service caused by presence of user	Other users
<i>Benefits</i>	<i>Received by</i>
Reduced need for private collection	User

PRIVATE COSTS OF LIBRARY USE

Use of a library by an individual causes costs to be incurred by that individual, by the library and by other users (as illustrated above). Each of these separate costs can be measured or at least approximated. The cost to the user depends on the value of his time (the opportunity cost), the convenience and efficiency of the library, and his efficiency in using the library's collection or in making his needs known to the librarian. There are many estimates of this cost.⁵

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The cost to the library can also be measured. It depends on the organization of the collection (open or closed stacks, for example), the efficiency of the staff, and similar factors. Baumol and Ordover have estimated the costs incurred by a major university library in fulfilling requests for a book to be circulated from its closed stack collection, to be accessed from its reserve collection, and to be acquired through inter-library loan.⁶ They calculated the marginal costs of each of these three types of usage. (The marginal cost is the cost of an *additional* use, given the currently existing level of usage.) These costs are summarized in Table 1.⁷

Baumol and Ordover also estimated the cost of the increased congestion (the loss of time by other users) caused by an additional use of a popular item in a busy library. They analyzed data on the usage of physics journals at the MIT library which showed a highly skewed distribution of usage. At that time the library had 229 physics journals in its collection. The eight most popular of these caused 47.9 percent of the use; eighty-two (37.3 percent) of the journals were not used at all during the 3½-month survey period.⁸ Combining these data with a standard queuing model and assuming that waiting time is valued at five dollars per hour, Baumol and Ordover found that the only instances where the marginal congestion costs are above ten cents are those cases where there is only a single copy of one of the five most heavily used journals (see Table 2).

From the above it can tentatively be concluded that the major costs of using a library collection are borne by the user, but that the user does impose a nontrivial cost on the library even for rather standard types of usage. (For example, the marginal cost for circulating an additional

TABLE 1. MARGINAL COSTS OF CIRCULATION, RESERVE AND INTERLIBRARY LOAN USAGE

<i>Type of Use</i>	<i>Estimated Marginal Costs</i>
Circulation	\$.98 - 1.58
Reserve	.35 - .44
Interlibrary loan	9.21-12.26

Note: All estimates were statistically significant at the $p < .05$ level except the low estimate for interlibrary loan costs.

Source: Baumol, William J., and Ordover, Janusz A. "Public Good Properties in Reality: The Case of Scientific Journals." In Susan K. Martin, comp. *Information Politics: Proceedings of the American Society for Information Science Annual Meeting*. Washington, D.C., ASIS, 1976, vol. 13, p. 464.

TABLE 2. MARGINAL CONGESTION COSTS FOR PHYSICS JOURNALS IN THE MIT LIBRARY

Journal Number*	Marginal Costs in Cents	
	Single Copy	Two Copies
1	65.00	2.87
2	42.50	1.25
3	20.60	.31
4	17.44	.20
5	12.30	.10
6	10.15	.076
7	7.10	
8	6.07	

* Ranked by frequency of use from highest to lowest

Source: Baumol, William J., and Ordoover, Janusz A. "Public Good Properties in Reality: The Case of Scientific Journals." In Susan K. Martin, comp. *Information Politics: Proceedings of the American Society for Information Science Annual Meeting*. Washington, D.C., ASIS, 1976, vol. 13, pp. 467-68.

item from a closed-stack university library was in the range of \$1-\$1.50.) On the other hand, the cost imposed by an additional user on the other users that results from the increased congestion is likely to be quite small (less than ten cents) in most cases.

IMPLICATIONS FOR PRICING

The fact that usage imposes a nontrivial marginal cost on the library and that, in the usual case, there is no usage charge, causes an inefficient overutilization of library resources. The magnitude of this inefficiency can be measured by the standard economics tool of consumer surplus (a measure of economic welfare) and is illustrated in Figure 1.

To compare the efficiency of having a usage fee or price that covers the marginal cost versus that of allowing free use, a few assumptions about the nature of the demand for library services and the marginal costs of serving additional users must be made. In Figure 1 the marginal cost is assumed to be a constant \$1.00 per use, and the demand curve is assumed to have a normal downward slope (i.e., per unit costs do not change with small changes in the number of uses, and imposing a usage fee will reduce the number of uses).

With these assumptions the consumer surplus with the \$1.00 fee is triangle ABE (the area under the demand curve BN and above the \$1.00 price), and rectangle OAEM reflects the costs (and charges) paid by the

could be reduced or even lost. The second point is that allowing fees to be collected may also enable different prices to be charged to different classes of users. This price discrimination may be used to increase efficiency or for the purposes of subsidizing certain classes of users.

PRIVATE BENEFITS OF LIBRARY USE

If the only benefits the user receives from using the library are from obtaining the same information that is available from alternate sources, it is merely necessary to compare the costs of the various sources and choose the one with the lowest cost. However, there are often differences in the benefits. For example, the reliability, currency and form of the information may differ. Also, there may be differences in the likelihood of obtaining the information. If the values of some of these considerations can be calculated, they should be included in the cost/benefit analysis. It is likely, however, that many of these will be difficult to measure or compare in anything other than a subjective manner. As a result, it is often necessary to revise the results of the cost/benefit calculations so that, to some degree, these additional factors are included. Although there has been some recent work in this area,¹⁹ the measurement of benefits continues to be much less exact than the measurement of costs.

IMPLICATIONS FOR LIBRARY ORGANIZATION

COSTS OF MULTIPLE SERVICES

Although there are many reasons to reduce costs by efficiently organizing and operating a library, the cost/benefit analysis approach highlights the fact that if costs were passed on to the user, their level would influence the decision of whether to use the library or a competing source of information. In the absence of institutional arrangements where users are charged the operating costs, the effects of cost changes are only indirect. If this is the case, the scale, organization and efficiency of the library will affect the quality of service to the user and the level of costs that are to be covered by the library or its parent organization. Nonetheless, it is obvious that someone has to pay for the costs incurred in operating a library and, as a result, the cost implications of different organizational structures are often important considerations in library planning.

The organization decision has several interrelated components. The question of library size and the economies of scale which may result are addressed in the article by Cooper in this volume. A similar set of choices

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exists in consideration of whether certain functions should be done separately or integrated with others in a single operational structure. In making this decision one should consider whether cost savings will result. For example, a technical library may find it less costly overall to have an information-on-demand service integrated into the library operations rather than to have it operate as an independent service. The existence and implications of such cost savings, known as "production complementarities," have been the subject of recent theoretical and empirical research.¹¹

One result of cost savings from the integration of multiple services in the library is that it is no longer possible to determine the average cost of any single service or function. This is because the total costs now depend on the levels (and the mix) of all the services.* An implication of this situation is that if costs are to be charged to the user, the level of these charges will depend not only on the volume of usage of the particular service in question, but also on the usage levels of the other services.

THE ROLE OF UNCERTAINTY AND RELATED CONSIDERATIONS

In deciding whether or not to use a library, a person evaluates the expected costs and benefits. Both of these are uncertain; for example, one could estimate the probabilities that the library will have the desired material and thus obtain some indication of the amount of time required for a search for the information and fulfillment of the request. Also, it should be noted that procedures or actions which increase the likelihood that the desired information will be available, or that reduce the expected waiting time, will make the library a more competitive option for the potential user. (It is also necessary to make these improvements known to potential patrons if one wishes to influence their decision.) Some disadvantages may accompany the benefits of certain library operational changes. A policy that stops all searches for material after reaching a set cutoff time can reduce the expected time that a search will take, as well as reduce the probability that the search will be fruitful. To determine whether such policies are desirable, it is important to understand both the distribution of search time and the value users place on this time.

Similarly, it is useful to consider the nature of the product or service provided to the user. Certain users might be satisfied with a citation or a

* The marginal cost concept used above, however, does still apply.

copy of the monograph or serial they are seeking. Others might need to be directed to a particular reference work. Still others might desire data or certain historical facts and be indifferent to the physical nature of the source (but not to the reliability). Efforts on the part of the library to help match the form of the output to the needs of the user can reduce the additional time the user must spend to obtain the desired information and put it into a usable format. This, and similar types of activity, can lower the true costs of library usage and thus make libraries more competitive relative to the alternative sources of information.

One final point that should be made is that from the user's point of view there is not necessarily a contradiction between service improvements and cost reductions by the library. Automating historically labor-intensive library functions such as cataloging and circulation has the potential for both reducing library costs and improving service to the users. Such improvements would enhance the competitive stance of libraries whether they operated under the regime of universal free provision of services or of charging fees for usage.

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