

## Program Budgeting and Cost Benefit Analysis in Libraries

*Libraries in academic institutions have traditionally prepared annual budgets based either upon subjective judgments or upon oversimplified formulas. Two budgeting techniques recently introduced into universities from the defense establishment are program budgeting and cost benefit analysis. Properly applied they can be utilized to gain better decisions in problems facing academic library managers and improved allocation of library resources.*

THE ANALYSIS of budgetary problems in such an industry as defense can be very complex, but not so difficult as those of the university environment, where outputs—both quantitatively and qualitatively—are somewhat more difficult to measure, and where costs are more difficult to come by. But even the difficulties of attempting to apply rational budgetary analysis to educational institutions generally are less complex than those of library management, where products are even harder to measure and where systematic effort to measure true total systems costs related to programs is a new activity. The literature reveals considerable dissatisfaction with the current state of library budgeting, even though the present fad of formula budgeting is a distinct improvement over the subjective judgment and arbitrary standards or requirements previously used.

There is now a new kind of budgeting process in government-type enterprises,

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and such other nonprofit activities as hospitals, churches, and education, which is not subject to the normal forces of a competitive economy or the price determination of the marketplace. Originally utilized in the defense establishment, these new techniques have been imported into the university world where they have proved to be tools of superior effectiveness in the general problem of resource allocation. These tools are program budgeting and cost benefit analysis.

Among institutions now coming to utilize these techniques for resource analysis—or “budgeting,” which is the more colloquial term—are the Universities of Colorado, Hawaii, Washington, and California. It seems inevitable that sooner rather than later these techniques of program budgeting and cost benefit analysis will be applied to library operations. “Forewarned is forearmed,” so it is better that librarians come to understand them before they are misused against them; being a sharper sword, they can cut a little more quickly even where it is not intended. More constructively, however, properly utilized they can also enable librarians to achieve a little more of what they

want within the constraints of available resources.

The normal budgeting process has two parts. First there is the resource acquisitions process; in that context formula budgeting may not be as unmitigated an evil as it sometimes appears on the surface. Second there is the problem of allocating resources among the competing demands for them. In the first part, some easily understood "gearing ratio"—which is all that formula budgeting really is—can aid the librarian in crossing the credibility gap and communicating effectively his need for funds to legislators, administrators, and other laymen who may not understand the subtleties and intricacies of his business. Once returned home, however, with the new resources, the librarian enters the second step, namely that of distributing them among his needs so as to maximize the benefits from them, and it is here that these new devices can aid him most. Sometimes, of course, they can also help the librarian to cross swords more effectively with competitors for the university or the public dollar, by putting up a more sophisticated and convincing analytical argument for his needs.

Let us first look at the problem of efficient resource allocation. We all live and work in a world in which our needs, or our requirements, or our objectives, are for all practical purposes unlimited; the wherewithal, however, to achieve these goals is indeed highly constrained. Thus the fate of librarians is the same as that of managers in any other industry: unlimited objectives and limited resources. To the extent therefore that a librarian or any other manager inefficiently allocates—not willfully, or maliciously, or consciously, but innocently—the limited resources available to him, he simply winds up with less of what he wants.

The real price of inefficient allocation, moreover, is not the misspent dollar, but the foregone benefits that were lost with

it. For example, say a librarian would like to accomplish three programs: increased circulation (Program A); extended reference service (Program B); and provision of new study space (Program C). You allocate your resources and find that they are being wholly devoted to Programs A and B, with C receiving no funds at all. If you later find that A and B received more dollars than they needed because you made a poor resource allocation decision, the misspent dollars are an inadequate way of calculating the cost of the bad decision; it is better to calculate the cost in terms of the foregone benefits from Program C, which was never implemented. This is because Program C, if you were justified in wanting to do it in the first place, would doubtless have produced results worth more than the funds to have been invested in it. In the jargon phrase of the economist, these are known as "opportunity costs."

There are several common causes of poor resource allocation. One is ignorance of, or the overlooking of, a better alternative for accomplishing an objective. This happens most frequently in highly disciplined organizations that have strong policy orientations—for example, in the military establishment with its strong doctrinal biases. Thus when presented a military problem, the Air Force typically finds that it needs more airplanes for its solution rather than, say, ships. The Army, on the other hand, seldom finds that it needs airplanes to solve its military problems; it is much more likely to recommend more divisions of men. There is in all organizations this kind of inertia and resistance to the unorthodox, although sometimes the unusual response will resolve a problem at lower total cost than will the orthodox. Thus decision-makers should always study the entire range of alternatives available to them before allocating resources.

A second, but less common, reason for

poor resource allocation is the pursuit of the wrong objective. At the outset of World War II, for example, there was need to develop anti-submarine forces since German submarines were very active; the objective of anti-submarine warfare was obviously to maximize the sink-rate of enemy subs. That sounded reasonable until people began to ask "Why sink subs?" When it was remembered that the fundamental reason was that they interrupted logistics flow, however, a new range of possible resolutions to the problem became apparent.

Another example of seeking a wrong objective involves the current and anticipated doctor shortage. People are tempted to view a formula that calls for a certain number of doctors per capita, observe increasing population and the output of existing medical schools, and conclude that vast amounts of money are needed immediately to mount new kinds of medical training programs. But many variables need to be introduced to get the true picture. First is the inflow of doctors from other geographical areas, second is the rapidly increasing individual productivity of doctors as a result of new technology, and third, of course, is the changing sociology of medicine that now makes it easier than it used to be for sick children to be brought to a clinic rather than the much less efficient method of bringing the doctor to them. After all this is done, however, one can ask, "Why do we really want more doctors?" When it becomes clear that the main problem is to improve the health of the community, it might become more desirable to put money into a school lunch program, or a TB testing center, or a measles vaccination program.

A third fairly common error in resource allocation is the pursuit of the right objective but beyond some reasonable point of diminishing returns. Some people enjoy a good cigar after dinner, for example, but a second cigar

is less rewarding than the first, and certainly the pleasure diminishes with the third and fourth. Indeed if attempted with martinis, certain *disutilities* eventually begin manifesting themselves.

Another common failing in making resource allocation decisions is the failure to recognize all the costs involved in an alternative. An example is the VA hospital that weighed two methods of effecting better TB cure—one which involved intensive nursing care and another which relied more heavily on drugs and equipment—and settled on the former because it appeared to be 20 per cent cheaper. What was not taken into account, however, was that a new wing had to be built on the nurses' quarters to house the enlarged staff necessitated by the decision. In this case also there were added social costs imposed not upon the VA but upon the small town near which the hospital was located. The highway to the hospital had to be widened, traffic lights had to be installed, as did a new sewer system. Good costing would have recognized these secondary and tertiary costs as well as the primary costs.

Typically, financial disaster lurks five, seven, or ten years down the road from what appears to be a simple cost decision today. Computers in universities, for example, originally came free. Computer manufacturers, and agencies like NIH and NSF, encouraged universities to accept them and begin work on them. Five or six years later the "free" computers began showing mounting operations costs to keep them going. In fixed budget situations these new charges began displacing other activities; thus again the true costs of computers in universities are the opportunity costs—the benefits that were foregone in activities that could not be undertaken because of the rising costs of the computer installations.

The function of a good cost benefit analyst is to bring some notion of op-



portunity costs to the attention of decision-makers. He could talk about the number of nurses needed to reduce the days a patient must spend in a hospital bed; perhaps the fourth nurse on the average would produce a very small improvement, and the opportunity costs of assigning her elsewhere would be too great to forego. The fourth highway patrol car in an area will reduce the accident rate by a much smaller per cent than numbers one, two, and three; the real measure of insisting on the fourth car is the forfeited benefit of putting that money elsewhere. The same thing can be true in the circulation department of a library where the length of time a patron has to wait for service can be driven down as more staff members are added to the desk. There are curves one could make here, however, which would show that the  $n$ th person produces a quite small improvement in comparison with the beneficial effect that same person could have had at some other point in the library's operation. Thus cost benefit analysis can help to produce a higher proportion of better decisions in resource allocation than can traditional methods of budgeting.

What then, against this background, really are program budgeting and cost benefit analysis? A program budget is a technique for organizing and displaying information about the activities or programs of an organization and their resource implications. It is intended to facilitate "eyeball" analysis by decision-makers and managers and provide the basis for more formal analysis of cost benefits. It is a way of budgeting which is concerned not with items, or objects of expenditure, or aggregations of cost categories for such things as personnel and travel, but with activities. The provision of reference service, circulation service, study space, microfacilities, are all activities in terms of which the program budget can be structured. These activities should all be looked at with

objective orientation; in other words, your objectives should not be to fill a building full of books or to attain some laudable book-to-student ratio, but rather to see that the information at the library's disposal is somehow got into the heads, or at least the hands, of the people who claim to need it.

What activities best enable you to attain these objectives? The program budget is then structured in these terms. For each so-called program element—such as personnel, equipment, facilities, supplies—one needs to determine the benefits, goods, utilities, or satisfactions produced. Often a proper measure of the output is difficult to settle upon; perhaps they could include the number and minimization of unfilled needs. In addition to determining the output of each program element, one needs also to determine the input of resources necessary to accomplish those outputs. A diagram showing each output and related input can help focus attention on the program and facilitate the identification of those activities with high and low payoffs.

Cost benefit analysis, on the other hand, is primarily an attitude. There are specific and formal techniques that can be applied in cost benefit analysis, such as multiple regression analysis and linear programming, but one does not need to master these techniques in order to possess a cost benefit analysis attitude. Even for persons who do possess such an attitude, the formal analytic techniques can aid in the process of decision making in matters of resource allocation. The problem of having a wide range of demand functions competing for limited resources faces us in corporate as well as in personal life. Program budgeting and cost benefit analysis, while not constituting a panacea, do provide a better way of maximizing the benefits and effectiveness of what inputs one is able to make.

Librarians are in a particularly diffi-

cult position to apply these techniques because they are purveyors of a free good, and when a valuable service is provided free, customers can be counted upon to avail themselves fully of it. Since the service is free, demand for it will increase vastly over time, and upon the librarian falls the task of having to go back to the university annually and justify the cost increment which this increasing activity represents. This is a real problem for librarians.

Why do not librarians charge for their services? Rationing of service is now done on the basis of rules and priorities—only faculty members have unlimited loan privileges; only graduate students can have access to the stacks, and many other constraining conventions keep service demands from overtaxing the budget. Would it not be possible to put a budget in the hands of a department, a school, a student, and then tell that individual or office that its budget is not only to cover its secretarial needs, computer time, supply costs, and such items, but its library service as well; the customer would simply have to decide for himself just how much he was willing to spend on library service in competition with his other expenditure categories. Such a situation might do much to rationalize people's demands for library service and make them more prudent than they sometimes are now. It would relieve librarians of that dilemma of having to say "No" to people, or after having said "Yes" of having to go to a disinterested third party and elicit the money to satisfy the customer's whim.

Or why do not librarians diminish their stocks of hard-cover books and ac-

quire in their stead substantial inventories of paperbacks which they would then give away free? We are inclined to reply, "Why, that would be crazy; our budget would soon be exhausted." And yet that is exactly what librarians are doing now except instead of giving books away free they are giving staff services away free. A system of internal pricings could be established which would make people more reasonable in their library demands and would help to regulate the highly valuable service libraries can render.

A student fee charge could be applied to an internal pricing schedule in a library. Students could actually be charged in cash or at the end of a term for the library services they drew upon, or all registered students could get an automatic library allowance that would be drawn upon every time they use the library. Once given its building, grounds, collections, and equipment, a library under this arrangement would turn into a so-called working capital fund which would support itself through the sale of its services. This would furnish to the library a dedicated fund source that would make it financially independent.

Such proposals as these, made in Socratic dialogue format and drawing upon the fundamental objectives of library service as their stimuli, can do much to prompt new approaches to old problems, to elicit new awareness of opportunity costs in the library industry. Taken together with program budgeting and cost benefit analysis, they can perhaps help in their own way either to gain new answers, or new support for old answers, to the major questions of resource allocation in libraries. ■■