

Chapter IV

First Steps in Using Cost Analysis

This chapter examines the requirements and key issues related to initiating a cost analysis. Specifically, the following topics will be discussed:

- the relationship between budgeting and cost analysis,
- how to define the service to be examined,
- how to select units of service delivery, and
- how to determine a good measurement of service.

Cost analysis is used to relate cost to services and to associate the results of governmental activities with the efforts required to achieve those results. Therefore, cost analysis deals with questions of quality and quantity of delivered services, differing methods of delivering services, the efficiency of service delivery techniques, and the trends in service costs over time.

Cost analysis can be an effective tool whenever the question at hand involves choices between alternatives, decisions on pricing a service, or more future-oriented questions, such as “What would happen if we. . .?” Cost analysis, though, is best used when it is employed as a diagnostic tool to identify management problems before a situation gets out of hand. The only headache one can really enjoy talking about is the one that was avoided.

Budgeting and Cost Analysis

The relationship between budgeting and cost analysis varies with the type of budget that is used — either line-item or cost center-based. The choice is highly material for the ease with which one can conduct a cost analysis.

Line Item Budgeting (LIB)

Many government budgets are developed, organized, and presented in a line-item format. Sometimes referred to as an “object of expenditure,” a line item is the estimated annual cost of one product or service. Examples are gasoline, electricity, heating oil, salary, rent, overtime, travel, architectural services, police cars, or anything else that is bought, rented, or consumed. Exhibit 1 is a sample line-item display based on an actual budget. Perhaps the greatest strength of LIB is that they easily allow for the control of expenditures with little or no computer support. On the other hand they say little or nothing about what services the budget supports.

Exhibit 1 "Sample Line Item Budget"

Fiscal Year 2003 Budget

Department Name: Parks & Recreation

Acct	Description	FY01 Actual	FY02 Budget	FY02 Estimate	FY03 Budget
10100	Salary-Base Pay	21,915,725	21,580,070	22,900,358	23,017,862
10105	Salary-Part Time	3,253,917	3,169,295	1,938,900	1,805,874
10110	Premium Pay	58,923	0	46,000	0
10113	Bilingual Pay	0	0	10,800	495
10120	Overtime	544,294	405,000	417,600	428,500
10130	Termination Pay	314,686	220,631	263,800	231,000
10135	Pension	2,010,718	1,960,375	1,940,500	2,092,092
10140	Social Security	1,892,181	1,916,847	1,899,100	1,925,974
10145	Health/Life Ins Active	2,398,005	2,357,740	2,327,992	2,519,440
10150	Clothing Allowance	0	0	0	0
10155	Vehicle Allowance	3,619	0	13,500	0
10405	Workers Compensation	1,538,518	1,400,758	1,263,500	1,354,926
10415	Unemployment Claims	43,635	39,200	1,100	22,400
10420	Long Term Disability	39,495	8,972	36,200	35,200
	Total Personal Services	34,013,712	33,058,888	33,059,350	33,433,763
20100	Chem. Gases & Spec Fluids	218,898	254,000	362,900	362,700
20105	Cleaning and Sanitary Supplies	115,397	105,720	133,500	207,600
20200	Construction Materials	715,261	783,213	725,400	784,400
20205	Electrical Hardware & Parts	397,139	412,600	311,600	320,300
20400	General Laboratory Supplies	0	0	0	2,000
. . .	[19 other line items deleted for reasons of space.]
	Total Supplies	3,669,303	4,060,907	3,995,350	4,851,100
30100	Janitorial Services	76,330	63,000	66,800	189,174
30105	Security Services	26,536	449,800	449,800	313,600
30110	Temporary Personnel Services	381,249	310,730	369,800	15,300
30345	Miscellaneous Support Services	960,540	554,300	4,500	0
30510	Telephone	369,742	452,200	417,100	417,100
30995	Interest on Past Due Accts	0	0	0	2,500
. . .	[37 other line items deleted for reasons of space.]
	Total Other Services and Charges	8,736,985	9,086,205	9,151,300	9,336,537
45000	Automobiles-Standard	0	0	0	0
	Total Equipment	0	0	0	0
	Grand Total	46,420,000	46,206,000	46,206,000	47,621,400

Exhibit 1 is based on a 1990's local government budget for a large city.

Edward A. Lehan, an authority on government budgeting, has noted¹ that “people talk about what you put in front of them”. Using this axiom as a basis, what would people talk about if presented with the above budget? At a minimum, answers would include

- the costs of things purchased, and
- the trend of those costs.

While each of the above topics is a relevant issue with regard to spending, neither address the purpose of expenditures: results to be achieved. Clearly a LIB is less than optimal for cost analysis.

The level of detail associated with line items (the chart of accounts) can vary enormously, from postage stamps to training. The first item, postage stamps, identifies everything but the denominations of the stamps to be purchased. Training, on the other hand, is considerably more general in nature. Expenditures for the latter might include travel to a training center, lodgings, and perhaps even some “food and ice,” especially if expense vouchers utilize misrepresentative coding.

Training as a concept is much more output-oriented than postage stamps. Some budgeting styles also focus more on the results achieved rather than on the goods consumed. Such budgets are referred to generically as program budgets, meaning that the focus of the budgeting process is not on items used but on activities to be performed and goals to be achieved. Program budgets are inherently more service-oriented than line-item budgets; because programs are usually described in terms of the collection of services they deliver.

The original implementation of program budgeting emphasized programs over organizational structure. Thus, for example, a juvenile delinquency abatement program might involve, recreation, schools, police, library, and possibly a “youth at risk” department. The problems of coordination and control posed by a multi-department approach (it can even be a multi-government approach!) were never effectively addressed.

Cost Center Budgeting

A large number of jurisdictions use a form of program-based performance budgeting that implements programmatic thinking but within organizational structure. Such jurisdictions arrange their budgets in cost center formats in which the total budget is presented as a series of department budgets and each department budget is presented in segments that correspond to major divisional elements which may be further subdivided into cost centers.

More detailed designs that place cost centers even deeper within the organization are both possible and occasionally desirable. Exhibit 2 shows several pages from one community’s public works department budget. The divisional levels of the department used in this budget are “public ways,” “sanitation,” “public grounds,” “cemetery,” and “sewers” as seen in the middle page.

Each divisional level, in turn, has been subdivided into “cost centers”. Exhibit 2 also shows the cost centers for the public ways division to be “construction/maintenance,” “cleaning,” and “snow and ice control” (foremost page).

¹ Lehan, Edward A. *Simplified Government Budgeting*. Chicago, IL: Municipal Finance Officers Association, 1981. (86 pp).

Exhibit 2 "Cost Center" Budget Pages

Actual 2001	Revised 2002		Budget 2003	PUBLIC WORKS -Summary
223 495	230 580	ADMINISTRATION	260 805	<p>STRENGTHENING MANAGEMENT. The public works budget for 2003 is a performance based program budget which relates expenditures to workload on a program basis. This budget reflects two ways public works management has begun to improve and refine program operations through the budgetary process. First, the creation of a new division within the service programs area reflects the effects of the newly enacted sewer service charge ordinance and will provide an accurate and comprehensive estimate each year.</p>
69 820	75 370	ENGINEERING	77 270	
6 047 862	5 364 055	SERVICE PROGRAMS	5 156 635	
<u>2 794 588</u>	<u>2 973 355</u>	SUPPORTING SERVICES	<u>2 957 370</u>	
9 135 765	8 643 360		8 452 080	

Actual 2001	Revised 2002		Budget 2003	PUBLIC WORKS -Service Programs/Summary
1 612 288	1 513 860	PUBLIC WAYS	1 185 645	<p>NEW PROGRAM CONCEPT INTRODUCED. The addition of a fifth summary level to the service programs has been prompted by the recently (march 14, 2002) enacted sewer service charge ordinance, as well as public works management's efforts to more programmatically reflect department expenditures. The total budget for sewer programs, \$ 1 349 770, will be supported by revenue received from the sewer service charge. Three allotments have been summarized in this total: Sewer rehabilitation, \$ 133 500; sewer maintenance, \$ 134 000; and metropolitan sewage, \$1 082 220.</p>
1 938 562	1 666 745	SANITATION	1 687 685	
559 055	550 565	PUBLIC GROUNDS	531 905	
411 025	419 925	CEMETERY	401 630	
<u>1 526 932</u>	<u>1 212 960</u>	SEWERS	<u>1 349 770</u>	
6 047 862	5 364 055		5 156 635	

Actual 2001	Revised 2002		Budget 2003	PUBLIC WORKS -Service Programs/Public Ways
1 057 775	748 485	CONSTRUCTION/MAINTENANCE	656 250	<p>CONSTRUCTION/MAINTENANCE. As reflected in the indicator below, sidewalk rehabilitation was the main focus of this programs efforts in the current year. An allocation of \$ 270 000 in block grant funding for 2003 reflects a decrease of</p>
278 963	315 375	CLEANING	329 395	
<u>275 550</u>	<u>450 860</u>	SNOW AND ICE CONTROL	<u>200 000</u>	
1 612 288	1 513 860		1 185 645	

If we ask the same question of Exhibit 2 that we asked of Exhibit 1, the answers are likely to be very different. The implied questions are primarily output oriented, questions about what is to be done or achieved as well as the cost — at least the direct cost — of providing those services.

The hind-most page of Exhibit 2 shows how to deal with indirect costs within a departmental budget. The costs of administering the department can, in theory, be allocated to all the services the department provides but, instead, are grouped in the “administration” division which, in this example, is broken down into “general management” and “business services” (not shown). Further, activities such as maintenance of equipment and the operation and maintenance of public buildings which support the department’s direct service activities but which are not directly services to citizens themselves are grouped into a “supporting services” division. Such “convenience cost centers” are a practical necessity to guarantee that every cost center has a manager and thus a person responsible for managing the budgeted funds.

Exhibit 2 shows how summarization can be used to integrate the parts of a department, its cost centers and divisions, into the total of the department budget. Exhibit 3 shows how a department, in this case the public works department, can be integrated in to the function of “community maintenance and development” and how governmental functions can be integrated into the total budget.

Preparation of a cost center-based budget is not a trivial matter. All the work required of a line item budget must be applied to each cost center and then the cost centers of a division accumulated to divisional totals and the division totals to a departmental total. Departments themselves should be accumulated to major functions and the functions to the total budget. This is hard work that will repay itself in usefulness.

Exhibit 3 “Cost Center Summarization”

Summary: The Budget

Actual 2001	Revised 2002	Program Expenditures	Budget 2003
12 118 291	14 253 630	general government	14 630 872
13 797 174	15 189 335	public safety	15 253 815
20 892 773	22 540 960	community maintenance and development	22 650 340
20 963 989	24 213 975	human resource development	26 548 215
<u>23 204 251</u>	<u>24 598 508</u>	education	<u>25 609 783</u>
90 976 478	100 796 408		104 693 025

Summary: Community Maintenance & Development

Actual 2001	Revised 2002	Program Expenditures	Budget 2003
9 135 765	8 646 360	public works	8 452 080
871 323	1 765 580	community development	1 678 330
4 070 812	4 156 085	mbta	4 180 875
7 093	8 635	conservation commission	8 635
66 456	47 975	historical commission	48 270
262 160	297 635	rent control	276 170
3 908 239	4 942 850	debt service	5 258 085
<u>2 570 925</u>	<u>2 678 840</u>	water	<u>2 747 895</u>
20 892 773	22 540 960		22 650 340

The budget from which Exhibits 2 and 3 are drawn had approximately 2,000 cost centers and more than 100 intermediate summary levels (represented here by the four pages of the exhibits above the “cost center” page). The object code list (chart of accounts) was seven pages in length. While the number of resulting account codes was very large indeed, the overall system was quite workable for line personnel because:

- most individuals used only a few codes repetitively, and because
- all documents were completely coded by the person who initiated them.

However, such extensive cost center budgeting is not possible without computer support.

The appropriate level of aggregation of activities for a cost center will depend on a variety of factors that will vary over time and from one jurisdiction to another. Generally, an ideal cost center represents a level of aggregation that allows services delivered to be linked directly with the costs of providing the services. If defined in this manner, a cost center will have its own measures of productivity (unit costs) and its own measures of benefits (the value of the services delivered).

The focus of the bulk of government expenditures does not change from one year to the next. Taxes must still be collected, potholes filled, and fires extinguished. Yet, while the overall situation changes very little, during the course of a year management will focus its attention on a few issues deemed to be of special interest. Perhaps investment procedures in the treasury department have become an issue, or the utility of fire alarm boxes is being questioned. It is important to remember that cost center budgeting is issue-oriented budgeting and, as important issues change, cost centers will also change. The use of cost centers facilitates the use of budgeting to implement management’s goals and objectives.

Generally speaking, a cost center format budget helps to achieve management accountability. It is also a giant step toward the implementation of a cost analysis, since most service costs will be grouped as they would have to be before a cost analysis could be performed. However, assume nothing. Verify with the individuals who prepare the budget that it represents the actualities of service delivery and not the wishful thinking of a creative budgeteer.

Defining the Service

The major component of a cost analysis is the selection of the unit of service to be analyzed. A service is an activity that is the responsibility of a particular department. It may be an activity performed by an individual, such as responding to a minor traffic accident, or by several individuals working together, such as operating a recreation center.

Most managers are familiar with calculating the costs of programs. Such calculations are typically required when applying for a grant, perhaps to begin a community day care center. Most managers are also familiar with the costs of operation, since budgets usually are written in terms of the operational costs of organizational units; for example, the cost of keeping branch libraries open would be listed.

However, the cost of services is different from either program costs or operational costs. Most programs include a number of different services lumped together. Frequently, when the cost of a program is calculated, many of the services involved are ignored. Few budgets for the city clerk’s office, for example, will provide a complete list of the wide range of services that office typically performs. Thus, most operational budgets represent

lines of management accountability for funds rather than listing the services that these funds will finance. The situation is further complicated by the fact that resources paid for in the last fiscal year might be consumed in this fiscal year (e.g., a left over supply of salt for snow and ice control) or possibly that costs incurred this fiscal year may not be paid until future fiscal periods (e.g., if pension under-funding is material).

Assembling Services

For each cost center in the budget, a complete list of services must be assembled. The best way to do this is to start with the budget. If your community has a program-oriented budget, it should contain information about the goals and objectives of the department. It should be a straightforward matter to begin to list the services currently being provided.

Since even a good program budget will rarely give a complete list of services provided, another approach should also be used. Most services involve personnel time, so one way of looking at services is to account for everyone's time on the job. Knowledge about what people are doing goes a long way toward providing a realistic base for understanding what services are actually being provided.

Definition of Standards

Not every departmental activity can be defined appropriately as a service from the perspective of a cost analysis. To be useful for cost analysis purposes, a service should have the following characteristics:

- *observability*: different observers should agree on what is being done, by whom it is being done, and for whom, if possible;
- *exclusivity*: an employee doing one thing should not be doing something else simultaneously; and
- *homogeneity*: the tasks necessary to perform the service should be reasonably similar from one instance to the next.

Of these three standards — observability, exclusivity, and homogeneity — exclusivity is the one standard most likely to cause a problem, because some governmental activities result in more than one service being delivered at the same time. For example, exclusivity raises problems in police work, since police officers often engage in more than one service at a time such as the issuance of parking tickets while on patrol. In such situations, considerable judgment must be used whenever a particular service must be costed.

Selecting Units of Service Delivery

Once a service has been defined, a unit of that service is simply one instance of the service. If the service in question is the investigation of burglaries, the unit of service is “the investigation of a (one) burglary.” If the service in question is health inspections, the unit of service might be “the completion of an (one) inspection.”

Creativity is helpful when choosing a unit of service since a unit of service must provide information that addresses management concerns and many of the obvious units of service may only appear to do so. In the burglary example, having information about the number of burglaries investigated may provide insight into efficiency but the number of burglary convictions may give information about effectiveness. Since both efficiency and effectiveness are desired, it may be advisable to measure both of these units of service.

Quantifying Service Units

The goal of public expenditures is service delivery. Quantifying service units is necessary for measuring the delivery of services. Simply put, one must count the number of instances of service delivery. Quantifying service units (as distinct from defining them) always answers the question: “How many?” For example, in measuring a police service, ask:

- How many assaults were investigated? and
- How many investigated assaults led to arrests?

Or, in measuring library services, ask:

- How many registered borrowers are there? and
- How many books were loaned?

For reasons of clarity, a distinction should always be drawn between a unit of service and its volume measurement. A unit of service is always a single instance of its delivery, while its volume is always the number of instances. Both concepts are important, but they are conceptually different and should be treated as such.

Determining a Good Measurement of Service

The above examples concerning volumes of service delivery for police and library services each suggest two somewhat different methods for measuring the outputs of the given organization. In general, there are many possible units of service for any given type of service.

Clearly, there are more possible units of service than there is time to measure. A selection process is needed, but first we must determine what constitutes a good unit of service.

In general, it is desirable that a unit of service focus attention on outputs as much as possible. Governments spend money to achieve goals, and a wise choice of units of service should always reflect the goals being pursued. From this perspective, assaults cleared by the police would be seen as more focused on desired results than assaults investigated. In the case of library services, books loaned is a more active measure of library goals than membership size.

A good unit of service should be:

- result-oriented,
- simple, clear, and understandable,
- amenable to accurate measurement, and
- acceptable to those who deliver the service.

Of these four characteristics, the one most frequently ignored or overlooked is the fourth — acceptance by those who deliver the service. It is absolutely essential that the people who actually deliver a service understand and agree on both its definition and its measurement. If the persons who deliver the service do not agree with the process, the likelihood of accurate data collection is reduced greatly. In most instances, the source of original data for any service will be the individuals who directly provide the service. Only with their

cooperation can an accurate understanding of service delivery problems, needs, and potentials be developed.

Beyond the availability of reliable data, a good unit of service should focus on an element of service over which there is some control. Data gathering is difficult, slow, error-prone, and usually expensive. The uses to which data are put must justify the effort expended to assemble the information. The cost of costing must not exceed the benefit gained from having the information.

Since the purpose of measuring a service is to provide management with the information it needs to improve either the quantity or the quality of the service, units of service must focus on critical variables whose alteration can materially affect the service delivery pattern. Ultimately, a unit of service must become a focus of action.

Services Are Not Delivered in Isolation

A police officer who responds to a robbery-in-progress call knows that he or she is not alone — other police officers are on their way to the scene; communications links with headquarters and other officers are maintained; and supervisors are shifting more distant officers in an effort to provide coverage to patrol areas left empty by the response. Such support functions, both direct (additional personnel on the scene) and indirect (the system's response to both the needs of the officers and the public) are vital to effective service delivery.

The above situation has an analog in cost analysis as well. Support services and leadership functions are a part of all services and must be considered in a cost analysis. While it is not always appropriate to include these costs in management decisions, their existence cannot be ignored.