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ABSTRACT

This report presents a model developed to examine costs of public library services, such as reference, circulation, and special programs, to be used by librarians in implementing a program budget and planning a budget system. Allocations for personnel costs, materials costs, costs of supplies and services, technical processing costs, reference use of the circulating collection, and administrative costs are presented. Also included are tables showing breakdowns of individual personnel costs, time study sheets of library tasks, and personnel costs by function. (AP)

# COST ACCOUNTING PROCEDURES FOR PUBLIC LIBRARIES: A MODEL



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## INTRODUCTION

There was a time when local public service agencies could justify their annual expenses simply because of the ostensible necessity or desirability of their services. Public libraries, public parks, and public schools, while they have rarely been inundated with an excess of revenues, could usually depend on a reasonable level of funding simply because the citizens believed these institutions were accomplishing something for the public benefit. That time of unquestioned acceptance has passed, and the time for public service accountability has arrived.

Public schools, elementary and secondary, were probably the first public service institutions to be challenged by the new interest in accountability. As competition for the public dollar intensified and the costs for education increased, interested citizens began to ask school administrators to show just what, exactly, they were accomplishing. If Johnny spends thirty hours a week in the school environment, just what has been accomplished, in any measurable way, during those thirty hours? Such a line of questioning makes it clear that we have been far removed from more serene times when we all accepted the worth of the little red school house just because it was part of our tradition.

Public libraries, which have rarely been high on the priority scale for revenues, have also been challenged to validate their expenditures. Tough minded administrators and elected officials have begun to ask librarians: "How much does it cost to check out a book?" "What are the measurable benefits of that check-out?" "How much does it cost to answer a reference question?" "Is that service really justified if we are simultaneously forced to cut down on police and fire protection?" And, perhaps the most nagging of all questions, "Why shouldn't library users pay for library services?"

Librarians, most of whom are not skilled in methods of cost accounting, have not been prepared to answer these questions. Like the museum director, the park superintendant, the zoo keeper, and others who are charged with managing a traditional, but non-essential public service, librarians have always believed that they were doing something worthwhile and hoped the city fathers would realize that worth and continue to provide the library with adequate tax dollars.

There is, as a matter of fact, an intrinsic and inescapable idealism connected with public library service. It amounts, almost, to a faith. Americans, now more than ever, put a high value on freedom of expression and they realize that, by extension, freedom of access to information is an essential corollary. They directly associate the free public library with that freedom of access to information. It is not by accident that free public library service has thrived most heartily in countries where democracy also thrives heartily.

But, again, tough minded administrators and elected officials do not look to exalted ideals to explain their budgets. While they may appreciate idealistic pronouncements, they must depend on stern practicalities to justify the expenditure of shrinking tax dollars. They deserve the best that we, as librarians, zoo keepers, or museum directors can give them to account for our services.

* * * *

Development of the Cost Accounting Model was originally contracted to the Denver Regional Council of Governments (DRCOG). Jack Sheerin, an economist with that agency, participated in initial investigations of public library operations to determine how those operations could be explained in cost accounting terms. Bill Johnson later took over the contract for the DRCOG and finished the design of the model. We have taken the methodological design, written it for popular consumption, and tested application of the model for acceptability. We think it is a meaningful first step toward a more refined cost accounting system for public libraries. Further refinements are certainly in order; they must wait for more experience with the model and even more investigation into the relationship of cost effectiveness methods and library operations.

## METHODOLOGY

Libraries are funded because the citizens of a community place a value on library service. As surely as a store sells a product at a particular cost to the buyer, a library provides a product that also has a cost. The cost of library service is not readily observable to the customer because, at the point of using the product, there is no charge. Our society has a long tradition of free library service and recent surveys have shown that this tradition is still respected by most citizens. Often, the only time costs of library services are examined is in the library budget, which usually shows the costs of maintaining library services, and when an individual taxpayer pays his taxes, a portion of which may be identified as funding library services.

As was mentioned earlier, this model attempts to tell us, in a comprehensive and detailed way, the cost of the service products of a public library.

### Service Products

The service products considered in this model are circulation, reference assistance, and programs, e.g. a children's story session. All three of these service products are quantifiable. Library staff members usually count circulation and the number of reference questions asked. To quantify the service that programs provide, the measure of a program attendance hour can be used. If twenty children attend a story session, one hour long, twenty program attendance hours have been provided.

The model is basically a simplified input-output analysis of total costs to determine unit or transaction costs:

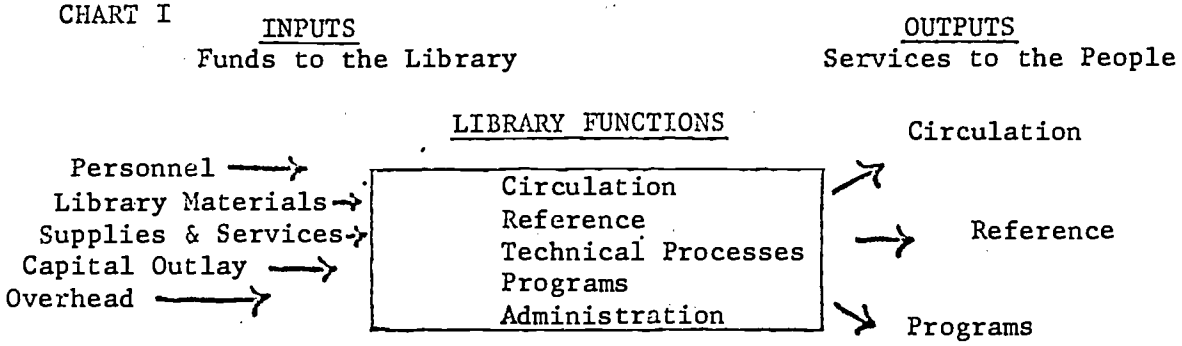
$$\frac{\text{Total cost of circulation}}{\text{Number of circulations}} = \text{cost per circulation}$$

$$\frac{\text{Total cost of reference}}{\text{Number of reference questions}} = \text{cost per reference question}$$

$$\frac{\text{Total cost of programs}}{\text{Program attendance hours}} = \text{cost per program attendance hours}$$

For this model, there are five cost sources which must be allocated: personnel, library materials, supplies and services, capital outlay, and overhead. Then there are five major library functions through which these costs must be funneled: circulation, reference, technical processing, programs, and administration. Of these five functions, only three, circulation, reference, and programs, are considered service products. The focus is on products, therefore all costs must ultimately be allocated to the three product categories. Technical processing is not an end in itself. It is only when the processed materials are used that the citizens (read taxpayers) have received any benefit from the money that it costs to do the processing. The same is true for administration. Both technical processing and administration must, however, be calculated in the costs for delivery of the service products.

CHART I




## The Observation Period

In applying the model, the analysts must decide on an observation period. Most public library revenues are allocated for a calendar or fiscal year period. It is preferable, therefore, to use this budget year as the observation period for cost accounting analysis. It is possible to use a lesser period, say one quarter, three months, and to extend the application by multiplying the observed results by four. Libraries, however, have seasonal trends for expenditures. Thus, it would be more accurate to use a time period exactly equivalent to the budget accounting year. The best time to apply the model is as soon after the end of the budget year as practical; in applying the model early, staff members can more easily remember important information that will be used.

TABLE I SUMMARY OF INDIVIDUAL PERSONNEL COSTS

| NAME | Base Pay | Pension 5.5% | FICA 5.85% | Life and Accident Ins. | Longevity 2% | Workmans Comp..012% | TOTAL |
|---|---|---|---|---|---|---|---|
| Armstrong Chief Circulation | $ 7,451.40 | $409.83 | $435.91 | $530.64 | $149.03 | $ .89 | $8,977.70 |
| Collins Library Director | 14,213.64 | 781.75 | 831.49 | 530.64 | 284.27 | 1.71 | 16,643.50 |
| Hansen Reference Librarian | 8,146.00 | 448.03 | 476.54 | 530.64 | 162.92 | .98 | 9,765.11 |
| Johnson Children's Librarian | 10,919.68 | 600.58 | 638.80 | 530.64 | 218.39 | 1.31 | 12,909.40 |
| Jones Page | 173.40 | --- | 10.14 | --- | --- | .02 | 183.56 |
| Lambert Circulation | 2,657.50 | --- | 155.46 | --- | --- | .32 | 2,813.28 |
| Ricco Technical Processes | 7,840.84 | 431.25 | 458.69 | 530.64 | 156.82 | .94 | 9,419.18 |
| Stevenson Circulation | 3,408.75 | --- | 199.41 | --- | --- | .41 | 3,608.57 |
| Swanson Page | 1,458.93 | --- | 85.35 | --- | --- | .18 | 1,544.46 |
| Townsend Page | 1,088.55 | --- | 63.68 | --- | --- | .13 | 1,152.36 |
| | $57,358.69 | $2,671.44 | $3,355.47 | $2,653.20 | $971.43 | $6.89 | $67,017.12 |

## Identified and Distributed Costs

Before beginning on the application of the model, two terms need to be clarified. "Identified" costs are costs we know are allocated to a particular function; e.g. the cost of a popular fiction piece can be positively identified as a cost for circulation services; the cost of a handbook or encyclopedia may be positively identified as a cost for reference services. If, however, we cannot identify certain costs positively, we must "distribute" them by some determined formula. We will repeatedly refer to "identified" and "distributed" costs throughout the model.

## THE MODEL

### Step 1 - Allocating Personnel Costs

The largest single expenditure for public library operations is almost invariably personnel expenses. The first and most important step, then, is to determine exact personnel costs and allocate them among the five major public library functions. To determine personnel costs, we must first know exactly how many people were paid from library revenues and exactly how much each person was paid. Then, we must determine how each person's time was expended for the pay received, i.e. how much time dedicated to which of the five major functions.

It may be that personnel costs can only be obtained from the city or county finance office. The library director may have official or unofficial records which may be helpful, but it is wise to verify them with the accounting office. Whatever documents are used, the analysts must be sure the pay records are complete. All personnel must be included and all payments must be included. Do not overlook fringe benefits and taxes. See Table I for an example of how individual personnel costs may be summarized.

TABLE II TIME STUDY SHEETS

Name _____ Week Beginning _____ Week Ending _____

Hours (H) Minutes (M)

| TASK | M H M | Tu H M | W H M | Th H M | F H M | S H M | Su H M | TOTAL H M |
|---|---|---|---|---|---|---|---|---|
| CIRCULATION | | | | | | | | |
| Checking materials out | | | | | | | | |
| Checking materials in | | | | | | | | |
| Registration | | | | | | | | |
| Collecting fines | | | | | | | | |
| Taking reserves | | | | | | | | |
| Shelving books | | | | | | | | |
| Driving BKM to circulation stops | | | | | | | | |
| Delivering books to homebound | | | | | | | | |
| Taking ILL requests | | | | | | | | |
| Calling reserves | | | | | | | | |
| Notifying overdues | | | | | | | | |
| Processing registrations | | | | | | | | |
| Reading shelves | | | | | | | | |
| Typing, answering phone for circ. | | | | | | | | |

| | M H M | Tu H M | W H M | Th H M | F H M | S H M | Su H M | TOTAL H M |
|---|---|---|---|---|---|---|---|---|
| REFERENCE | | | | | | | | |
| Aiding information searches | | | | | | | | |
| Answering reference questions by phone | | | | | | | | |
| Verifying ILL requests | | | | | | | | |
| Tours & miscellaneous | | | | | | | | |
| Typing, answering phone for reference | | | | | | | | |

| | M H M | Tu H M | W H M | Th H M | F H M | S H M | Su H M | TOTAL H M |
|---|---|---|---|---|---|---|---|---|
| PROCESSING | | | | | | | | |
| Selection | | | | | | | | |
| Ordering | | | | | | | | |
| Receiving | | | | | | | | |
| Cataloging | | | | | | | | |
| Processing (jacketing & lettering | | | | | | | | |
| Discarding materials | | | | | | | | |
| Mending | | | | | | | | |
| Inventory | | | | | | | | |
| Filing catalog cards | | | | | | | | |
| Typing, other clerical tasks for processing purposes | | | | | | | | |
| Weeding | | | | | | | | |

TABLE II TIME STUDY SHEETS - Continued

Name _____ Week Beginning _____ Week Ending _____

| TASK | M H M | Tu H M | W H M | Th H M | F H M | S H M | Su H M | TOTAL H M |
|---|---|---|---|---|---|---|---|---|
| PROGRAMS | | | | | | | | |
| Booking rooms | | | | | | | | |
| Planning programs | | | | | | | | |
| Carrying out programs | | | | | | | | |
| Making signs | | | | | | | | |
| Setting up displays | | | | | | | | |
| Publicity for programs | | | | | | | | |
| | M H M | Tu H M | W H M | Th H M | F H M | S H M | Su H M | TOTAL H M |
| ADMINISTRATION | | | | | | | | |
| Making reports (personnel, payroll, etc.) | | | | | | | | |
| Scheduling hours | | | | | | | | |
| Interviewing | | | | | | | | |
| Preparing for board meetings | | | | | | | | |
| Typing, answering phone for administrative purposes | | | | | | | | |
| Meetings & conferences | | | | | | | | |
| Leaves, holidays, time off* | | | | | | | | |

*Includes only those times for which the individual is paid

Next, the analysts should hand out the time study work sheets, Table II, and show the library director and the staff how to fill out these forms. The forms are most suitable for a weekly period. Ideally, we may wish to complete them for the entire year. Practically, though, it will probably be satisfactory to have the personnel fill out the form for a sample period, say, one month. From the sample period, the analysts can fairly easily extrapolate an acceptable figure for the entire observation period.

Note the form includes only the five major public library functions which we discussed earlier: circulation, reference, processing, programs, and administration. Some library directors or analysts may wish to add certain other major functions. This is probably not necessary and may serve to confuse the intent of the model. Some may wish to add certain subordinate functions; this can be done without difficulty. Any refinement that can be added to the model is acceptable so long as it does not make the model excessively detailed or unmanageable.

After collecting the time study sheets, the analysts should interview all personnel regarding the periods of time dedicated to the five major functions. This is done to clarify and verify the entries the staff members have made. There will be mistakes. All personnel will have questions and will be anxious to talk about what they have been doing.

In addition to interviewing each of the persons who are presently employed at the library, it is necessary to determine how people who are no longer employed had spent their time. If, for example, the study is being conducted in January, it must be determined how an employee who was paid from March to September of the previous year spent his time within the five major functions. This is best done by extending the time allocation reported by the person who now holds the position, the replacement. It may also be done by questioning those who supervised, or worked with, the now absent employee.

TABLE III ALLOCATING PERSONNEL COSTS BY FUNCTION

| | | CIRCULATION | | REFERENCE | | TECH.PROC. | | PROGRAMS | | ADMIN. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | Total Pay | %of time | Cost | % of time | Cost | %of time | Cost | %of time | Cost | %of time | Cost | Total |
| Armstrong | $ 8,977.70 | .7437 | $ 6676.72 | 1201 | $1078.22 | .0821 | $ 737.07 | | | .0540 | $485.69 | $8977.70 |
| Collins | 16,643.50 | .0814 | 1354.78 | 1273 | 2118.72 | .2943 | 4898.18 | .1151 | 1915.67 | .3819 | 6356.15 | 16643.50 |
| Hansen | 9,765.11 | .0109 | 106.44 | 6942 | 6778.94 | .1319 | 1288.02 | .1202 | 1173.76 | .0428 | 417.95 | 9765.11 |
| Johnson | 12,909.40 | .0084 | 108.44 | 2019 | 2606.41 | .3704 | 4781.64 | .2835 | 3659.81 | .1358 | 1753.10 | 12909.40 |
| Jones | 183.56 | 1.0000 | 183.56 | | | | | | | | | 183.56 |
| Lambert | 2,813.28 | .9812 | 2760.39 | | | | | | | .0188 | 52.89 | 2813.38 |
| Ricco | 9,419.18 | .0520 | 489.80 | | | .8914 | 8396.26 | | | .0566 | 533.12 | 9419.18 |
| Stevenson | 3,608.57 | .9374 | 3382.67 | | | .0626 | 225.90 | | | | | 3608.57 |
| Swanson | 1,544.46 | 1.0000 | 1544.46 | | | | | | | | | 1544.46 |
| Townsend | 1,152.36 | 1.0000 | 1152.36 | | | | | | | | | 1152.36 |
| TOTAL | $67,017.12 | | $17,759.62 | | $12,582.29 | | $20,327.07 | | $6,749.24 | | $9,598.90 | $67,017.12 |
| % of TOTAL COSTS | | | 26.5 | | 18.78 | | 30.33 | | 10.07 | | 14.32 | 100 |

Once there is an accurate accounting of how the personnel spent their time, the time given to each of the major functions must be converted to a percentage of the total time worked in the library. This percentage must then be correlated to the employee's pay. This is best done on a form like that shown in Table III. These figures are then summarized. The summary provides the complete personnel cost allocation.

Step 2 - Allocating Materials Costs

The next expenditure to consider is for library materials. In this step, we must determine how materials expenditures are allocated to the five major functions. The great bulk of materials will go to circulation and reference. Some librarians, however, may buy materials to be used exclusively for administration, technical processing, or programs.

For Step 2 it is highly convenient if the acquisitions staff (or someone) knows for what purpose the materials were purchased. Often, however, this is not the case; accounting methods often do not spell out the intended uses of certain purchased materials.

This raises the whole question of what are distinctly reference or circulating materials. What about audio-visual materials? Microform? Periodicals? And all other forms of media that are now common in a public library.

The most reasonable distinction we could derive was simply contingent on whether or not the particular materials circulated. For purposes of this analysis, we determined that those materials which are most commonly used in the library itself should be considered reference materials. This may be artbitrary, but it seemed to be the most acceptable of a number of compromises. What, then, about periodicals that may not circulate the first year after purchase but which can circulate later? Because there is no amortization factor in this model, we attributed the materials to that function which they would serve after the first year of purchase.

If the accounting methods are sufficiently descriptive so we can know whether materials are intended for reference or circulation, the analysts can "identify" cost allocations accordingly. If the accounting methods are not sufficiently descriptive, the analysts may "distribute" the costs according to a formula based on the existing collection. To apply this formula, let us say the existing collection is divided as in Table IV.

TABLE IV DIVISION OF THE EXISTING COLLECTION

| Materials | Circulating | Non-Circulating |
|---|---|---|
| books | 41,703 | 3,016 |
| periodicals | | |
| -bound | | 226 |
| -microform | | 176 |
| -loose | | 202 |
| pamphlets | | 381 |
| 16 mm films | 24 | |
| 8 mm films | 101 | |
| film strips | | 63 |
| phono discs | 529 | |
| cassettes | 36 | |
| art prints | 178 | |
| sculpture | 21 | |
| TOTAL COLLECTION | 42,592 (91%) | 4,064 (9%) |

In the absence of detailed information, the total materials acquisitions expenditure for the observation period can be distributed accordingly: in the example, 91% to circulation, 9% to reference. It is highly likely, though, that some staff members will have definite knowledge of how much of certain media were bought with the acquisitions budget. In this case, perhaps, the formula needs to be applied only to the book budget, as distinct from the total materials budget.

Then there emerges the question of comparative costs for reference books and circulating books. As we know, reference materials cost considerably more than popular trade materials. The analyst must, in this case, adjust accordingly, using their best judgement.

TABLE V ACQUISITIONS EXPENDITURES

| Materials | Circulating | Non-Circulating |
|---|---|---|
| books | $15,813.17 | 1,106.91* |
| periodicals | | 1,678.74 |
| pamphlets | | 9.32 |
| 16 mm films | 786.19 | |
| 8 mm films | 384.27 | |
| film strips | | 84.19 |
| phono discs | 167.32 | |
| cassettes | 84.31 | |
| art print | 181.17 | |
| sculpture | 102.28 | |
| TOTALS: | $17,518.71(86%) | $2,879.16(14%) |
| Cost: Total Acquisitions | $20,397.87 | |

*Certain non-circulating books may be intended for exclusive use of the library staff. If there are such purchases, identify them accordingly.

TABLE VII ALLOCATING SUPPLIES & SERVICES COSTS

| Expenditure Identified | Circulation | Reference | Technical Processes | Programs | Administration | Distributed | TOTAL |
|---|---|---|---|---|---|---|---|
| Acme Stationery | | | | | | 48.95 | 48.95 |
| American Bindery | | | 1,015.00 | | | | 1015.00 |
| American Bindery | | | 648.00 | | | | 648.00 |
| B & B School Supply | | | | 21.35 | | | 21.35 |
| B & B School Supply | | | | | | 39.85 | 39.85 |
| Data Services | 489.19 | | | | | | 489.19 |
| Elton Graphics | | | | | | 192.00 | 192.00 |
| Fred's Typewriter | | | 19.95 | | | | 19.95 |
| Fred's Typewriter | | | | | 24.50 | | 24.50 |
| Jostens | | | 1,059.23 | | | | 1059.23 |
| Kings A-V Supply | | 24.50 | | | | | 24.50 |
| Louise's Gift Shop | | | | 31.82 | | | 31.82 |
| Monroe's Photography | | | | | 26.95 | | 26.95 |
| Norris Business Forms | 67.50 | | | | | | 67.50 |
| Xerox | | | | | | 642.00 | 642.00 |
| TOTALS | $556.69 | $ 24.50 | $2,742.18 | $53.17 | $ 51.45 | $922.80* | $4,350.79 |
| Distributed Additions | 244.54 | 173.00 | 279.89 | 93.20 | 132.14 | | |
| FINAL TOTALS | $801.23 | $197.50 | $3,022.07 | $146.37 | $183.59 | | $4,350.79 |

*Distribute according to personnel percentages in Table III; e.g., 26.5% x 922.80 = 244.54

After due consideration of what is known and not known about the acquisition expenditures for the observation period, and using our best judgement for that which is not positively known, the analysts may come up with a result something like that expressed in Table V. For this model, $2879.16 is called the reference share of the library materials budget; $17,518.71 is the circulation share.

The materials costs are then added to the personnel costs, Table VI.

TABLE VI PERSONNEL & MATERIALS COSTS ADDED TO THE 5 LIBRARY FUNCTIONS

| | Circulation | Reference | Processes | Programs | Administration | TOTAL |
|---|---|---|---|---|---|---|
| Personnel | 17,759.62 | 12,582.29 | 20,327.07 | 6,749.24 | 9,598.90 | $67,017.12 |
| Materials | 17,518.71 | 2,879.16 | | | | 20,397.87 |
| TOTALS | $35,278.33 | 15,461.45 | 20,327.07 | 6,749.24 | 9,598.90 | $87,414.99 |

Step 3 - Allocating Costs of Supplies and Services

The next major block of expenses is for supplies and services. These include such random items as office supplies, technical processing supplies, duplicating services, and data services. These costs are usually for expendable supplies and recurring services. So far as possible, these costs should be identified. We know, however, that librarians rarely identify the intended use of all supplies and services. Certain supplies such as catalog cards and book jackets can be positively identified for technical processes; registration cards can be positively identified for circulation services. But supplies like pencils, stationary, and typewriter ribbons are usually made available to all sections of the library as they are needed. For these expenditures, those that can be identified should be identified. Those that cannot be identified should be distributed according to the percentages of direct personal services costs in Table III. This procedure was chosen because using direct personal services for a base is considered to be the most representative for allocation of indirect costs to functions in a labor-intensive operation. Also, this is the procedure usually followed in program budgeting. Table VII depicts the procedure for allocating these costs.

After all the costs of supplies and services have been allocated to the five major functions, these can then be added to the personnel and materials costs, Table VIII.

TABLE VIII SUPPLIES & SERVICES COSTS ADDED TO THE FIVE MAJOR LIBRARY FUNCTIONS

| | Circulation | Reference | Technical Processes | Programs | Administration | TOTAL |
|---|---|---|---|---|---|---|
| Personnel | 17,759.62 | 12,582.29 | 20,327.07 | 6,749.24 | 9,598.90 | 67,017.12 |
| Materials | 17,518.17 | 2,879.16 | | | | 20,397.33 |
| Supplies & Services | 801.23 | 197.50 | 3,022.07 | 146.37 | 183.59 | 4,350.79 |
| TOTALS | $36,079.02 | $15,658.95 | $23,349.14 | $6,895.61 | $9,782.49 | $91,765.24 |

Step 4 - Allocating Capital Outlay

Capital outlay should be treated in the same way we treated supplies and services. If positive identification can be made, it should be made. For example, you may know that certain furniture purchased in the last year was installed for circulation services. A typewriter may have been bought specifically for technical processing. A microform reader may have been intended for reference purposes. Certain capital outlay expenditures such as shelving may be shared by different functions in the library; the librarian will have to use judgement in these cases.

Those items you cannot identify must be distributed according to the personnel formula. See Table IX. The capital outlay expenses are then added to the accumulating costs, Table X.

TABLE IX ALLOCATING CAPITAL OUTLAY

| Expenditure Identified | Circulation | Reference | Technical Processes | Programs | Admin. | Dist. | TOTAL |
|---|---|---|---|---|---|---|---|
| Patio Repair | | | | | | 1374 | 1,374 |
| Shelving | 2,200 | 450 | | | | | 2,650 |
| Atlas Stand | | 175 | | | | | 175 |
| Roof Repair | | | | | | 340 | 340 |
| Work Tables | | | 120 | | | | 120 |
| Lounge Chairs | | | | | 420 | | 420 |
| | 2,200 | 625 | 120 | | 420 | 1714* | 5,079 |
| TOTALS | 454.21 | 321.89 | 519.86 | 173.11 | 245.44 | 1714.51 | |
| FINAL TOTALS | $2,654.21 | $946.89 | $639.86 | $173.11 | $665.44 | | $5,079.51 |

* Distributed according to personnel percentages in Table III;
e.g. 26.5% x $1,714 = $454.21

TABLE X CAPITAL OUTLAY ADDED TO THE FIVE LIBRARY FUNCTIONS

| | Circulation | Reference | Technical Processes | Programs | Administration | TOTALS |
|---|---|---|---|---|---|---|
| Personnel | 17,759.62 | 12,582.29 | 20,327.07 | 6,749.24 | 9,598.90 | 67,017.12 |
| Materials | 17,518.17 | 2,879.16 | | | | 20,397.33 |
| Supplies & Services | 801.23 | 197.50 | 3,022.07 | 146.37 | 183.59 | 4,350.79 |
| Capital Outlay | 2,654.21 | 946.89 | 639.86 | 173.11 | 665.44 | 5,079.51 |
| TOTALS | $38,733.23 | $16,606.14 | $23,989.00 | $7,068.72 | $10,447.93 | $96,844.75 |

Capital expenses are often amortized. Equipment, furniture, initial book stocks, and other highly expensive items may be amortized to avoid a disproportionate expenditure for this observation period. Most city treasurers or financial managers can provide suggestions on an amortization formula for capital expenses.

## Step 5 - Allocating Overhead Expenses

Overhead expenses are those which have no cumulating value but which are necessary to maintain the operation. Examples of overhead expenses may be utilities, telephone, insurance, rent, plant maintenance, and security.

It will probably be convenient to allocate all overhead expenses to the administrative function. Administrative costs will be subsequently distributed cc, unless there is a clear reason to identify certain overhead costs in one of the other major functions, it will make good sense to allocate overhead to administration. Table XI shows how this is done. At this point, the analysts should have accounted for all of the library costs for the observation period.

TABLE XI ALLOCATION OF OVERHEAD EXPENSES TO ADMINISTRATION

| | Circulation | Reference | Technical Processes | Programs | Administration | TOTAL |
|---|---|---|---|---|---|---|
| Personnel | 17,759.62 | 12,582.29 | 20,327.07 | 6,749.24 | 9,598.90 | 67,017.12 |
| Materials | 17,518.17 | 2,879.16 | | | | 20,397.33 |
| Supplies & Services | 801.23 | 197.50 | 3,022.07 | 146.37 | 183.59 | 4,351.06 |
| Capital Outlay | 2,654.21 | 946.89 | 639.86 | 173.11 | 665.44 | 5,079.51 |
| Overhead | | | | | 15,425.00 | 15,425.00 |
| TOTALS | $38,733.23 | $16,606.14 | $23,989.00 | $7,068.72 | $25,872.93 | $112,270.02 |

## Step 6 - Allocating Technical Processing Costs

As was mentioned earlier, the technical processing activity is not an end in itself, but, rather, a means to an end. The technical processing function simply serves to make library materials accessible in an orderly and manageable way.

Technical processing costs, which include all the personnel, supplies, equipment, and other costs spent on processing during the year, should generally be allocated to reference and circulation. If the processing staff has maintained accurate records on the number of items that have been processed for reference and for circulation, the appropriate percentages of the costs can be allocated using this breakdown.

For example, if a library added the following materials to the collection during the year:

CHART 2

| | Circulation | | Reference | |
|---|---|---|---|---|
| Books | 1428 | | 55 | |
| Periodicals | | | 48 | |
| Pamphlets | | | 120 | |
| 16 mm films | 3 | | | |
| 8 mm films | 26 | | | |
| Filmstrips | | | 6 | |
| Phonodiscs | 42 | | | |
| Cassettes | 14 | | | |
| Art prints | 18 | | | |
| Sculpture | 7 | | | |
| | 1538 | (87%) | 229 | (13%) |

The total number of added materials was 1767, of which 13% went to the reference part of the collection and 87% went to the circulating part of the collection.

Technical processing costs could then be allocated by adding 13% to the total cost of reference and 87% to the total cost of circulation. See Table XII.

TABLE XII ALLOCATING TECHNICAL PROCESSING COSTS

Technical Processing = $23,989

$23,989 x .87 = $20,870.43

$23,989 x .13 = $ 3,118.57

| | Circulation | Reference | Technical Processing | Programs | Administration |
|---|---|---|---|---|---|
| | $38,733.23 | $16,606.14 | $23,989.00 | $ 7,068.72 | $25,872.93 |
| Technical Processing | 20,870.43 | 3,118.57 | -23,989.00 | Ø | Ø |
| TOTALS | $59,603.66 | $19,724.71 | Ø | $7,068.72 | $25,872.93 |

The processing staff, however, may not have maintained records of items processed in this manner. If that is the case, the second best approach is to determine what proportion of the total collection is in reference (non-circulating) and what proportion is circulated. The technical processing costs can then be allocated to reference and circulation using the "share of the collection" percentages as was done in Step 2, Table IV.

## Step 7 - Reference Use of the Circulating Collections

Often library materials that circulate, most particularly non-fiction volumes, are used by the library clients or by the reference staff to answer reference questions. For example, a circulating biography of Thomas Jefferson may answer a question about American history. Because of this cross-usage, some of the costs of circulation should properly be charged to the reference function. Although there is no completely accurate method for determining the reference use of the circulating collection, the best approach seems to involve a short-term study where circulating volumes used for reference purposes are counted.

In conducting the study, during a particular period (e.g. two weeks), signs can be posted on all shelves where circulating non-fiction volumes are housed. These signs might read:

> "We are conducting a Survey. Please do not reshelve books used in the library. Place them on the tables after you have used them. Thank you.
>
> Library Staff"

During the trial period the reference staff should collect and count the non-fiction circulating books that are left on the tables by users and the non-fiction circulating books that the reference staff used for reference work. For greatest accuracy, this should be done every hour or so. At the end of the two week period, the total number of books used in this way can be compared with the circulation during the same period to obtain a percentage that we call the reference use of the circulating collection. If, for example, there were 93 books left on the tables and the circulation during the same two weeks was 4308, the reference use percentage was 2.16%. (93 divided by 4308 = 2.16%).

Another acceptable approach would be to multiply 93 by 26 to obtain the annual figure and divide this by the total annual circulation.

Once this percentage is obtained, it is used to compute the cost that should be subtracted from the circulation function and added to the reference function. See Table XIII.

TABLE XIII ALLOCATING THE REFERENCE USE OF THE CIRCULATING COLLECTION

| | Circulation | Reference | Programs | Administration | TOTAL |
|---|---|---|---|---|---|
| | $59,603.66 | $19,724.71 | $ 7,068.72 | $25,872.93 | $112,270.02 |
| Reference | - 1,287.44 | 1,287.44 | | | |
| TOTALS | $58,316.22 | $21,012.15 | $ 7,068.72 | $25,872.93 | $112,270.02 |

## Step 8 - Allocating Administrative Costs

At this point, the total library costs are distributed among the four remaining functions: circulation, reference, programs, and administration. Administration, like technical processing, must be allocated to the other functions because administration does not produce an actual output. To allocate administration, determine the proportion of direct personnel costs that go to reference, programs, and circulation (ignoring technical processing personnel costs) and allocate the administrative costs by these proportions. See Table XIV. We can now calculate the unit output costs.

TABLE XIV ALLOCATING ADMINISTRATIVE COSTS

| | Direct Personnel Services | Percent |
|---|---|---|
| Circulation | $17,759.62 | 47.88 |
| Reference | 12,582.29 | 33.92 |
| Programs | 6,749.24 | 18.20 |

$25,872.93 x .4788 = $12,387.96

$25,872.93 x .3392 = 8,776.10

$25,872.93 x .1820 4,708.87

| | Circulation | Reference | Programs | Administration | TOTAL |
|---|---|---|---|---|---|
| | $58,316.22 | $21,012.15 | $7,068.72 | $25,872.93 | $112,270.02 |
| Administration | 12,387.96 | 8,776.10 | 4,708.87 | -25,872.93 | Ø |
| TOTALS | $70,704.18 | $29,788.25 | $11,777.59 | Ø | $112,270.02 |

## Step 9 - Calculating Unit Costs

To calculate the cost per circulation, divide the total circulation cost by the number of circulations for the year. Assuming the annual circulation was 112,000 the unit cost is computed in this way:

$$\frac{\$70,704.18}{112,000} \qquad \$.63 \text{ per circulation}$$

To calculate the cost for a direct reference question, divide the total reference costs by the number of reference questions. Assuming there were 4500 reference questions asked during the year, the unit cost is computed in this way:

$$\frac{\$29,788.25}{4500} \qquad \$6.62 \text{ per question}$$

Finally, to calculate the cost per program attendance hour, divide the total cost of programs by the number of program attendance hours. If the actual attendance was not recorded, multiply the total number of programs by the average attendance and multiply that number by the number of hours or portion of an hour that programs usually lasted. Assuming there were 2607 program attendance hours, the unit cost is computed in this way:

$$\frac{\$11,777.59}{2607} \qquad \$4.52 \text{ per program attendance hour}$$

## POSSIBILITIES AND LIMITATIONS OF THE MODEL

This model has several advantageous possibilities as well as limitations. To get the most out of the model, librarians should have a clear idea of both its advantages and its limitations.

The limitations of the model refer largely to information which the model simply cannot provide. It does not, for example, evaluate quality of service, staff, or collections. Nor can it tell the librarian the number of outputs which the library should be producing or judge the priorities that library administrators should adopt. Although the model reveals valuable cost information, it does not tell whether that cost is too high or too low.

The most important advantage, of course, is that it focuses on the products of libraries; it is result oriented. While the importance of determining the exact cost of a unit of service may be questioned, most librarians have found that, once unit costs are known, they can be used for a variety of purposes. They are most valuable as they may compare with similar unit costs in other circumstances, e.g. the unit costs of the previous year or the unit costs in another library. The unit costs for various services also deserve comparison.

More importantly, perhaps, availability of such information is extremely valuable in making appeals for revenues. Legislators, somehow, derive a sense of well-being and confidence if they can know the exact costs for units of service.

In the course of investigating these unit costs, the library manager can also discover some useful management information that he may not otherwise discover. The manager will inevitably take a closer look at how staff time is being utilized and how staff costs are divided. He may, for example, find that too many highly paid personnel are spending too much time on routine functions. Or he may find that low salaries in one service area, while they may cut unit costs, are creating excessive turnover which, in the end, reduces the quality of the service. The library manager will also be able to make a closer determination of unit processing practices. Application of the model will also provide some insights into administrative costs. Then, too, the model has a way of forcing the librarian to take a detailed look at the relationship of the development patterns of the reference and circulating collections. Finally, application of the model may encourage library managers to alter their routine accounting procedures. The model can be applied to a line-item budget, but it reveals some feasibility for implementing a program budget, and, possibly, a complete program, planning budget system.