

COST OF INFORMATION SERVICE

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Any survey of the literature concerning the cost of reference service reveals the fact that the subject is one which has been much discussed but without arriving at any very generally accepted conclusions. About 40 per cent of the writing on the topic is devoted to remarks on how ridiculous it is to think that reference and information service is measurable; about 30 per cent on how ridiculous the results are where it has been attempted; about 20 per cent on reporting results (with many apologies for doing so); and the remaining 10 per cent on straightforward statements of procedures, limitations, and valid interpretations. One of the great difficulties seems to be the confusion or misunderstanding of such terms as "measurement," "cost," and "value." The suggestion that reference and information service can be measured is immediately drowned out with a recital of all the variables of personnel, clientele, physical layout, etc. These have nothing to do with actual "measurement." They do have everything to do with the use to which the measurement is to be put. "Measurement" is only the comparison of a standard unit with some entity and does not include the comparison of one entity with another. Similarly, one hears the objection that the "value" of a reference answer bears no relation to the time spent in finding it, and therefore why try to do anything? The basis of the objection is valid, indeed; there is no relationship between value and cost. But the objection itself is invalid in its assumption that valuation is the purpose of cost analysis. A cost study attempts, purely and simply, to find out what something costs. What it is worth is something entirely different. Information service can be measured quantitatively and the costs determined but comparisons cannot be made with the data; or the "value" measured.

The subsequent question is: "Yes, you can [measure reference costs], but should you?"¹ Lord Kelvin once remarked, "I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it;

but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be." It should be of interest to any administrator to know what happens to the funds he disburses and what the various operational costs of his organization are. Beyond this basic curiosity, there are many practical uses for these figures. Budget preparation and defense obviously benefit from the availability of concrete, properly defined, and interpreted cost figures. One's impression of the proportionate expenditures for various functions may receive a rude jolt from careful measurements of time spent. Any decisions on expenditures depend on a knowledge of costs.

The determination of unit costs involves the establishment of the relation between the time spent on a given function and the amount of work performed. To obtain the necessary figures for the calculation, a program of work and time study is essential. Cost-finding is but one of the many benefits of such study. Through indicated staff and schedule adjustments, it is possible to improve the balance of work load and personnel, both in a single department and between departments. Performance in comparable operations can be checked, with elimination or improvement of relevant factors. The need for a particular change, whether major or minor, may become clearly apparent; and the results of such change may be checked in cold numbers rather than by non-objective feelings. This is true of such factors as shifts or increases in staff, as well as the addition of new reference materials or procedures. It is possible to spot trends in information needs, to effect at least a partial check on efficiencies, and (given the proper data) to correct gaps in the book collection. In one instance, it was found that 20.6 per cent of the questions were of the "where is" type, and a few judiciously placed signs did wonders for the work load.^{2, 3} Any conscientious examination of exactly what is done, when, where, and how long it takes, can hardly fail to discover one or more changes to improve the production or morale.

Many of the points cited against information cost studies do exist. However, the majority refer to the use of results in comparing information service in different libraries or in establishing "norms." They mention the variations in professional competence, adequacy of book collections, accessibility of catalogs and reference tools, the abilities of users to find their own answers, provision of special reference materials

(pamphlets, pictures, documents), the level of clientele, and other elements which cannot be quantitatively evaluated and which most certainly do affect the reference department output. It is quite true that such factors make strict comparisons impossible between libraries. However, they are not relevant to the actual measurement of cost in a single library.^{4, 5}

Fremont Rider answered several objections in reporting his early work in library cost accounting. He felt that many of the techniques used in businesses could be employed by libraries.⁶ The so-called "bookkeeping" often found in libraries is not adequate for cost studies; it neglects such items as depreciation, interest, and capital investment, and is not kept in a way which provides ready answers. However, the real culprit is deliberate ignorance of what is required to give meaningful figures, and the data required are not as complicated as many librarians plead. The mere keeping of some statistics is not sufficient; these must reflect real output if true costs are to be obtained. The cost of maintaining the records is not likely to prove significant, when sufficient care is given to selection of methods, basic data needed, and explanation to the staff. A last argument sometimes found--surely not among serious professional people--is that it is better to "let sleeping dogs lie."

Failures of cost systems are not due to the fact that "libraries and librarians are different." Some adaptation of business methods may indeed be necessary, but given adequate and accurate procedure, library practices are as subject to examination as those in the Western Electric Company. Similarly, the proper interpretation of cost figures must be made. As R. A. Miller and others point out, the determination of unit costs does not, in itself, solve any problems, financial or administrative; it merely helps, as they say, to "dimension" them.^{7, 8}

Since 1950, considerable mention has been made of "performance budgeting." More and more libraries are adopting it, especially those at various governmental levels; Hoover Commission recommendations brought about its use in the federal government in 1951. Essentially, this method makes primary allocation of costs according to function performed, rather than by item of purchase. At the District of Columbia Public Library, accounts were formerly kept on conventional lines: personnel, travel, rent and utilities, printing and reproduction, supplies and materials, equipment, and capital expense. Under performance budgeting, the primary division of accounts shows administration, processing, public service,

buildings and grounds, and capital expense. The headings formerly used are now found as subdivisions under each of the new, function-oriented divisions. This arrangement concentrates attention on the character of work performed, not on materials and services purchased.⁹ The preparation of this kind of budget as well as accounting of current expenditures requires the accumulation of exactly the sort of data needed in calculating unit costs; only a refinement of terms measured is required, so that the true output of each functional division is known.

Unit cost determination depends on two things: what and how much was done; what did it cost. Each of these elements contains many points for argument and to some extent, arbitrary decision. What shall constitute a unit of reference or information service? Where does reference work end and some other activity begin? Do clerical assistants ever perform true reference work? These and dozens of other questions account for the confused thinking on this business and for the difficulty in using results in making comparisons. At present, there is no standard of what is meant by "reference" or "information" service. Each library must establish, after careful analysis, the types of services its information staff performs, and the most workable sizes for units of work in each service. The small library may have fewer services and fewer units of measurement than the large; the need for specific data in a given situation and the feasibility of gathering that data, will dictate these decisions. As a beginning, it is suggested that each staff member keep a random list of his operations for a week or so. At the end of this time, in consultation with the supervisor, the lengthy list can be organized into areas and related groups. This simplifies record keeping, which is best done by groups--for example, "filing" of whatever kind. Assigned codes for these operations, when once familiar to the staff, makes the process even easier.

The one service which is provided by all reference departments is the giving of information, in both large and small quantities. The most common practice is to record the incidence of questions asked and/or answered, often distinguishing between in-person and telephone categories. One library subdivides its inquiries into directional, instructional, advisory, reference, and search questions.¹⁰ Other libraries may restrict their categories to but one or two of these, depending on the variety and frequency of occurrence. Generally, separation is made between questions not requiring use of bibliographic tools or collections, and those utilizing them in greater or less

degree. Additional reference services tabulated may include bibliographies compiled, interlibrary loans processed, talks given, and other public relations work. 11, 12

The units chosen for measuring the amount of each of these services performed depend on the frequency of occurrence. "Time spent" is the usual distinguishing feature, if any, for reference questions. Some libraries merely count the total number. W. O. Pierce recommends as many as four groupings: those requiring less than 5 minutes, 6 to 14, 15 to 29, and over 30 minutes.¹³ Units for other services are simple and obvious: number of bibliographies compiled, number of loans processed, number of talks given, etc. Each of these might conceivably be divided according to time spent. Services frequently performed, with considerable variation in time and effort, should be provided with a large range of work units, so that the results will accurately reflect the total work done, since an average time is not particularly meaningful. Indication of subject areas, number of volumes used, actual questions and answers, and subject questions not answered are refinements which add to the value of a work study but are not specifically relevant to the cost. In order to obtain really valid work units, H. N. Peterson reminds us that such units must: (1) be countable; (2) represent true output; (3) reflect work effort, not be just a pure number; (4) be consistent within the organization and in time values; and (5) use familiar terminology.¹⁴

Thus far, only the amount of work performed, in units of output has been reviewed--so many five-minute questions, so many interlibrary loans processed, so many individuals instructed in the use of reference tools, so many thirty-minute searches, and so many bibliographies compiled. Next the amount of time spent must be determined. The only way to record time for accounting purposes is by means of a diary--for example, a single sheet for each day for each person, with spaces for time down the left side; designation of type and unit of work run across the top, with a column for non-productive time, such as personal, phone calls, etc. (See Figure 1.) The time and work units may be printed on the sheet, or filled in. The "Time" periods at the left are best left blank, but the type of work can be preprinted, with number of actual units to be filled in. Thus if three loans are processed from 10:45 to 11:05 a. m., the from-and-to time is entered, with the figure "3" noted in the loan column. These tabulations may be transferred to cumulative sheets for each person, making final use of the data easier. This bookkeeping operation (transfer to

summary sheets) for one department of fifteen persons takes about half an hour a day.

Most libraries keeping only the statistical record of quantity, do so on a continuous basis; some which keep time records also do so continuously but this is not usual except where a streamlined procedure has been devised or the data are required for accounting records. Many undertake a periodic sampling, --for example, the 15th of each month, a full month at five year intervals, or the first week of each month.¹⁵ Continuous recording has been recommended (1) to eliminate the inherent differences in questions; (2) to eliminate the differences in reference ability and recording accuracy; and (3) because it is claimed that the larger the total number of units, the less significant the individual differences become.¹⁶

After translating the services and time spent into figures, the average time required for each unit of work performed is found. A determination of costs is the next step and there are arguments in this area also. The first record of library cost accounting dates from 1876, when Cutter gave the figure of 50¢ as the cost of cataloging a volume.¹⁷ Generally speaking, the elements making up total cost include labor, materials, and overhead. The proportion attributable to each element varies in business. As Rider points out, printing has dominant labor costs; in textiles the materials are highest; while overhead in a hydropower plant runs ahead of both labor and materials. His opinion was that overhead came first in his library, with labor next, and materials last. Today, it is common to add 100 per cent to labor cost to cover overhead and materials, or 50 per cent to cover overhead alone.

Direct labor costs are the most obvious utilization of total time and unit time figures. The first can be used when the total cost of a department is wanted, the second when a breakdown by operation is desired. But even here, what constitutes the cost of an employee's time must be decided. One study figures the hourly rate by dividing the annual salary by the hours worked in fifty-two weeks plus one day.¹⁸ Another figures it on the basis of eleven months, thus increasing the hourly rate to cover paid vacations.¹⁹ A third takes into account all the fringe benefits, adding to the annual salary the cost to the library for social security and group insurance, and dividing by the hours in fifty-two weeks of work, less vacation, less paid holidays, less half the allowable sick leave. This increases the straight hourly rate about 12 per cent and gives a very close picture of the total unit labor costs to the library; some of the elements here are sometimes considered as ad-

ministrative overhead, although actually they are directly related to employment.

Some cost studies stop after determining the direct labor involved in operations. Having calculated the hourly rates for each employee, the unit operational costs for that employee are obtained by multiplying by unit time figures. To be even more accurate, the costs of unproductive time may be distributed over the productive time, since all has to be paid for but only part brings results. This step may not be taken, although the factor is accounted for if only total cost of a department is determined from total time spent. However, the amount of non-productive time must be known to have an accurate picture of the individual productive operations.

The study should go beyond the mere labor factor to obtain a true figure of an institution's total costs. Materials and supplies are not difficult to bring into the picture. Only certain operations utilize forms, stationery and the like, and the allocation of pennies involved in each operation can be made if desired. The amounts are usually so small that it easily may not be worthwhile (Inter-Library Loan forms, 2 1/2¢), although the total departmental costs should be available for performance budgeting.

The tricky part and the one in which there is much variation in practice, is the determination and allocation of overhead. In itself, overhead may contain items for salary and material which are not chargeable to functional departments. Judgment must be used in deciding whether to charge particular costs to departments, or keep them in an unassigned lump sum. These include telephone, trucking, postage, travel, and salaries of personnel in administrative positions such as a personnel officer, payroll clerk, or even a chief librarian. One method of distributing all such costs is to allocate them proportionally according to departmental payrolls; admittedly, there are instances where this might be unjust, but generally it is thought to be a fair procedure.

Another group of overhead items relates to the building, its maintenance and protection, such as insurance, heat and light, janitorial labor and supplies, and repairs. If the building is rented, the rent may include some of these elements. If not, interest on capital investment and depreciation must be considered. The allocation of such costs as these bears little relation to services performed or to the people involved. One method used which is quite reasonable is based on the proportionate number of cubic feet occupied by the various departments. Getting such costs down to the unit operational cost

level is the ultimate step, and here the distribution may be according to the total time spent within a department on a certain function, divided by the number of units of that function produced.

It is a matter of judgment how far each library may wish, or be able, to carry out these costing processes. All of the steps outlined can and have been applied in one situation or another. Almost none of them are completely defensible or airtight. The real or imaginary distinctions between professional and clerical operations have not been mentioned for these have no bearing on the total cost picture. However, they do have a bearing on unit costs and on the interpretation and use of the work study results. Similarly, no mention has been made of the cost of book and periodical collections, reference tools, and binding. Each library must decide whether to allocate such costs directly by subject or functional department, or treat them as capital expenditures subject to depreciation, obsolescence--or even appreciation--with appropriate assignment to overhead and some system of allocation therefrom. Most of the above points are matters of using common sense and careful analysis, and of remembering that the purpose of any cost analysis is to show the real costs of each article or each unit of service produced. In that light, many of the supposed complications are rather easily settled. These costs can be worked into a formula to determine the cost of a five-minute reference question.

The real complication arises when the figures are taken out of context and applied to an entirely different situation. This is where the danger lies and from it most of the criticism is derived. Some very humorous paragraphs have been written, comparing the \$1.37 it costs to answer a question in one place and the 33¢ in another. It was thought ridiculous for Emma V. Baldwin and W. E. Marcus in 1941 to find that in thirty-seven public libraries, the average question took 5.4 minutes to answer and cost 6.8¢.^{20,21} The ridiculous, or perhaps meaningless, part is the averaging of all the questions in thirty-seven public libraries. The salary of 1.3¢ per minute isn't funny--that was the rate of pay in 1941. As Rider has stated, for averages there must be many libraries, a long period of time, and many units--and even then the figure is not really useful, just a curiosity; real costs are not averageable, they must be for each individual library, and mean nothing except as the conditioning factors are known.²²

The proportion of an institution's total expenditures charged to reference and information services likewise must

be examined with care, although there is likely to be greater conformity here--perhaps, plus or minus 50 per cent, instead of 2000 per cent as with the cost of answering questions. In their 1941 survey Baldwin and Marcus²³ found that 7.5 per cent was allocated for reference service, based on average time distribution (not the same as cost distribution) for the thirty-seven public libraries. For academic libraries, I. T. Littleton made a study in 1956, covering sixteen large college and university libraries. He discovered that the median staff time assigned to reference work was 5.95 per cent, and the median salary distribution was 6.5 per cent.²⁴ The John Crerar Library's payroll reveals that about 8 per cent goes to persons assigned primarily to free reference service; perhaps another 10 per cent is accounted for by the staff giving reference service on a fee basis, though they are self-supporting and are not covered by general library income. Since John Crerar is a large research library the 18 per cent total seems relatively justifiable. However, a recent job study resulted in some interesting time records. The principal reference librarian in one department spends but 37 per cent of his time in direct public service, including interlibrary loans; 26 per cent is devoted to book selection and administration; 20 per cent to matters connected with photocopy problems; and 17 per cent to clerical operations. This illustrates the revealing nature of time records. The 8 per cent shown by the payroll for free information service may drop considerably under the influence of time studies.

There appears to be some degree of correspondence in the figures on proportion of total costs, although the areas defined as "reference" or "information" in these surveys differ considerably. In general, technical processes eat up 30 to 35 per cent, and circulation about 30 per cent of the income in public libraries and 10 to 20 per cent in college and university libraries. Again, figures on proportions, like departmental and unit costs, must be judged wholly in conjunction with the local conditions. Open shelves vs. closed shelves, popular vs. research, downtown vs. suburbia, academic vs. public vs. special--these and many other factors must be weighed when considering the meaning of any report, be it statistical, cost, proportion, or any other type.

To complete the picture of reference service costs, cooperative information services, on a local as well as national level, must be considered. In some cases these costs are easier to determine than the others but their meaning is no clearer. The eighteen member libraries of the Midwest Inter-

library Center pay approximately \$90,000 per year for its operation, and the individual assessments range from about \$1,500 to about \$10,000. These are based on a formula taking cognizance of certain budgetary figures, the number of doctorates awarded, plus flat fees.

The MILC program is the most fully developed of the few such interlibrary projects now in existence. A four-college Minnesota group has thus far been subsidized for development of the over-all plan, and have each contributed the labor of checking periodical files for their union list. Figures on real costs are not cited--seldom are they known in such projects, unless particular care is exercised in keeping track of time spent.²⁵ K. D. Metcalf's proposal for a Northeastern regional library envisioned \$1 million to start (MILC had more than that), \$100,000 for the initial shipments, and \$55,000 a year after that.²⁶ These figures illustrate the order of magnitude when cooperation gets to the point of building buildings and acquiring materials. How much of these costs is strictly "reference service" is difficult to know. Some offer professional assistance, others offer purely storage or acquisition-cost sharing as primary benefits. The other examples of regional organization of services and the various bibliographic centers have in them elements of pure reference cost, as well as non-reference costs--just as are found in a single library. What the exact costs are is hard to ascertain but cooperation can cost as much the library is willing to pay. The big plans run to big money, even when shared. The National Union List of Serials would probably now cost several million dollars to revise completely. For example, it cost hundreds of dollars for each of 316 libraries to provide Chemical Abstracts with holdings for its List of Periodicals. The national Union Catalog at the Library of Congress, another of the few cooperative efforts on a countrywide scale, is probably the least expensive to individual libraries, though the Library of Congress itself bears the greater part of the cost. Yet cooperative reference service can be had at relatively small cost on a comparatively localized basis. A group of Virginia and District of Columbia libraries have established such a service with only a discussion meeting and frequently renewed contacts required; reference requests are referred on a planned basis to the most logical source.²⁷

The most frequently given example of cooperation is interlibrary loans, and how much actual reference service is provided depends on the individual transactions. Basically, it is an extension of the circulation process, and the reference work

is equivalent to that performed in assisting a reader to get exactly what he wants though perhaps it is slightly more complicated, since borrowed materials tend to be of an uncommon kind. Cost figures have varied up to as high as \$7.00 for a complete transaction, but the most extensive study, by J. G. Hodgson, showed an average of \$1.32 for borrowing and 69¢ for lending (based on number of loans completed), with costs at larger institutions running more than at smaller.²⁸ At Columbia University, it took \$2.70 to borrow and \$1.27 to loan a book; the personnel fraction for borrowing was 54 per cent and for lending 84 per cent.²⁹ Use of bibliographic centers resulted in decreased unit loan costs in the Hodgson study, although if the membership support was considered, it was more expensive; this was because the centers got the more difficult questions.

Just how much reference work is involved in interlibrary loans has not been revealed quantitatively; three of the four persons mentioned in the Columbia study are non-professional, and Hodgson observed that very often professional time was consistently spent on operations of a clerical nature. Faulty citations in loan requests make the need for competent handling obvious. However, one analysis of 546 requests (containing 285 errors) found that only 8 per cent could be called serious errors, another 24 per cent might cause some difficulty, 20 per cent were minor errors, and 48 per cent were acceptable as they stood.³⁰ This indicates that costs may possibly be reduced through an operations analysis, and the reference portion may become comparatively small.

Communications facilities are a big factor in establishing these cooperative ventures. While the U.S. mails do get the information through, extensive development promises use of new techniques. The flashier ones (such as phototransmission, Ultrafax, etc.) are not yet generally available and their costs are astronomical for common usage. However, teletype has been rather widely used and proves quite workable; a number of so-called networks have been set up, following the lead of Racine and Milwaukee. In 1955, at least thirty-three libraries were listed on an MILC Directory Card for TWX. Increasing costs and relatively small use to date have caused a number of cancellations; the current national TWX directory shows sixteen library installations in the classified section, though some additional ones are to be found in the main listing. Costs of a loan in the Racmil arrangement were reported in 1956 as \$1.36, including messenger and service charges.³¹ At John Crerar Library the records show 138 incoming and ninety-

seven outgoing calls over the past two years. With the monthly TWX service charge this amounts to \$1.28 per call for all of the 235 calls, plus a regular message rate charge for any non-collect calls originated by Crerar.³² All of this is really a sidelight on cooperative reference efforts, indicating some of the cost factors involved. Generally speaking, any extensive efforts to date have cost money, real money, whether they be union lists, TWX installations, or bibliographic centers. In nearly all instances, the improvement in readers' services, both in time saved and in resources made more readily available, has been counted worth the cost.

The original proposals for the content of this paper ended with a pressing question--is reference service worth what it costs? Some of the most beautiful and liquid prose in library literature has been devoted to this subject. It can be shown that one librarian's time paid off at \$2,000 per minute, and that a little child came back to life as a librarian found certain references but the original problem of valuation still exists. No one can honestly tell what the correct answer to his question means in hard dollars and cents--at least, not very often. The most objective approach to the problem comes from a British information officer, and is particularly appropriate when a hard dollars and cents reply is needed: what would it have cost to find the answer if the librarian--or even the library--were not there?³³

Not the least of many values is the benefit to a patron of explaining just what it is that he wants to know to an analytically-minded reference librarian; very often in this process the problem is clarified and stabilized to such an extent that there is no longer a question. And one final thought on the value of reference service: what would be the cost without it, in terms of the lost potential use of the library's collections and of recorded knowledge in general? Librarians can buy materials, catalog them, and shelve them by the yard and a certain proportion, probably a sizable one in some cases, will be touched upon and exploited by the patrons working on their own. What greater proportion, what further exploitation, what magnification of resources can be produced by knowledgeable, resourceful--and thus valuable--reference work?

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