

# Using Qualitative Methods in Measuring Work Efficiency of Library Services

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## Abstract

Current presentation aims to clarify what kind of qualitative methods have been used in assessing the work efficiency of libraries through library history and how the new cost accounting models, such as activity-based costing (ABC) and time-driven activity-based costing (TDABC) are researched and adapted by university libraries, focusing on the methods used for measuring work time allocation.

The data used in this paper are based on reviewing and summarizing of relevant studies which were conducted in libraries inspired by the ideas of modern theoretical considerations and treatments relating to cost accounting and costing, originally developed for industry and private sector organizations. Cost accounting as well as time and motion studies related with scientific management ideas of libraries throughout history have been closely related to the identification of performance – effectiveness, efficiency and productivity – or in other words, how efficient is the employees' use of their work time. Efficiency equals results divided by costs, in other words, the efficiency of employees means how much good quality work is being done in as short time as possible. Traditional cost accounting research as well as new cost accounting researches such as activity-based costing and time-driven activity-based costing in libraries have almost always combined both qualitative and quantitative methods, like analysis of statistical data (e.g. collecting all types of accounting data about the costs that occur in the production of library services), documents (e.g. job descriptions), time sheets and time diaries, observations, interviews or questionnaires.

**Keywords:** cost accounting, timing, activity-based costing, time-driven activity-based costing, work efficiency

## Introduction

Since the industrial revolution (1750-1870), when handwork began to be replaced by machine work, the problem of finding the most economical way of doing a task has occupied men's minds (Battles 1943).

Libraries are considered structures, which are slow in integrating in the new economic environment – the implementation of the methods of library performance evaluation and benchmarking in the management processes of the library and in forming strategies is taking place gradually. Basing one's management practices on the evaluation of effectiveness, capabilities and contribution, and measuring the usage of resources requires efforts, willingness and understanding. For a long time the management of libraries did not pay attention to such areas of librarianship as the development of the effective management of book collections, classification, cataloguing, and the like. This inattention was not important; the small size of collections, staff, buildings, and clientele made for simplicity of operation and demanded not very sophisticated approach to the ways of doing things (Coney, 1952, p. 83).

By the end of the 19<sup>th</sup> century, libraries had become service-providing institutions, whose task was to collect, store, preserve and make available books for users. Simultaneously, libraries developed a need to justify their budget and costs to their parent organizations, was it university (in the case of university libraries) or local government (in the case of public libraries).

Library managers at the end of nineteenth century were ready to start to apply the ideas of scientific management and cost accounting.

The development of scientific management required also the development of comparable methods for accounting and reporting, so that the actual status of progress and costs could be monitored. Among the tools of performance management, accounting is the oldest, dating back to at least the Renaissance. As modern performance management grew, however, it was apparent that adequate control required far more detailed cost data than existing budgetary accounting provided. This led to the development of cost

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accounting systems which related costs to the work performed (Hayes, 2001, pp. 3-4).

Librarians in these libraries were interested in achieving maximum efficiency at minimum cost. They accumulated data on unit costs, particularly costs associated with the cataloguing and processing of materials (which amounts to a large part of the library's budget), in order to identify the ways which would reduce these costs. Cost accounting studies as well as time and motion studies which were developed at the end of the 19th century, were started to undertake regularly to create efficiencies in library operations through time reductions (Lynch, 1978, p. 262).

A literature overview, conducted by author of this paper, of how libraries embraced cost accounting and timing as the possible methods to measure work efficiency of library between 1877 and 2014, indicates a great interest in this theme among libraries. This paper gives an overview about the methods used in studies of cost accounting in libraries.

### **Cost Accounting and Work Time Allocation as Research Topics in Libraries**

The first library cost accounting studies took place already in the second half of the 19<sup>th</sup> century. The first reference to library cost accounting in professional literature appears to have been in the very first volume of the *Library Journal* in 1877, where Charles Cutter, in reply to an inquiry, estimated "the cost of cataloguing" for an unnamed large library as \$0.40 per volume and for an unnamed small public library as \$0.16 per volume (Rider 1936, Harris 1989).

The early studies and reports of the results of the library cost accounting (Cutter, 1877; Whitney, 1885; Bishop, 1905) indicate that one of the main reasons why cost accounting reached libraries was the need of library managers to justify their costs to the public as well as to their parent organizations, which however was seldom easy. Critics seemed to think that investment in the cataloguing system was a total loss. In addition to cataloguing costs, the work which did not seem to involve costs in the eyes of the public had to be justified, such as helping readers to find necessary books, keeping shelves in order so that every book could be found at its designated spot, replying to written enquiries etc.

The first library institution, which was used in the measuring of cataloguing in terms of time spent was The Grand Rapids Public Library (USA) in 1914 (Reichmann, 1953). The organizational committee of this study reported that: "Today the library must emulate the business organization in employing the cheapest grade of labor where it can be used and using its highest priced labor only for strictly professional work" and "Each member of the staff should be doing the most advanced work for which she is equipped" (Morsch, 1954). This study marked the beginning of a new stage in the history of cost accounting research. The librarian no longer was a scholar with independent time use, but was transformed into an employee performing routine

work, to whom in addition to accuracy and thoroughness the requirement of speed and productivity in performing work tasks was set.

Only *cataloguing costs* are ever mentioned in all these early references. Probably because it has always been the most costly part of library work and thus library managers are constantly looking for ways to cut these costs. Lucile M. Morsch (1954) says that: "Economy in cataloguing is economy that actually saves expense in money or time on the library budget as a whole, and does not merely save this expense in the catalogue department to transfer it to another department or to some future time" (Morsch, 1954, p. 479).

A study carried by Fremont Rider in Wesleyan University, Middleton, Connecticut in 1935, focused on the idea that administration and overhead should be calculated as part of cataloguing costs, by which Rider meant the rent or cost of housing the catalogue department, heating, lighting, water, telephone costs, printing, stationery and postage, depreciation, insurance, janitorial services and building repairs. The authors of the study warn that no cost system can cut costs. All it can do is to show the administrator where the costs may and should be cut (Rider, 1936; Harris, 1989).

In 1940s, libraries began to adapt the time and motion studies method, originally developed by Frederick W. Taylor and further developed by Frank and Lillian Gilbreth.

While library literature contains many examples of cost studies and reports of time devoted to different phases of the library operation, there have been not many applications of time and motion study technique in the formal sense. In fact, many of these studies actually exist only as the manuscript materials (for example, Jewel C. Hardkopf and Watson O'D. Pierce studies from 1949, refereed by Logsdon, 1954). Time and motion studies in libraries (e.g. Baldwin & Marcus, 1941; Battles et al, 1943; Hardkopf, 1949; Pierce, 1949) did not only measure the performance of individual worker but also dealt with such matters as work simplification, salary standardization, determination of the standards of performance for specific library operations, improvement of working conditions (in regard to light, noise, fatigue), systematic in-service training, and employee turnover. Another characteristic of the use of time and motion studies in libraries was a careful definition and assignment of work in each department. Work definitions were expected to facilitate the measurement of performance. They fixed responsibility of the performance and influenced the hiring and assignment of personnel (Lynch, 1978, p. 261).

The 1960s and 1970s were the times when social indicators emerged in public sector management including libraries. This movement is closely related to human resource management. Besides staff management and its intra-organizational aspects, human resource management deals with the general issues of human management, including those related to the labor market and job performance. Job performance evaluation makes it possible to assess positions

and employees' work (work performance) (Türk, 2005). Although a number of theories and paradigms were developed to manage, analyze and study the organization and its activities, the principles devised by Taylor still appealed to many library managers. Random time sampling for work and cost analysis became popular among library managers and researchers (Spencer, 1971; Masterson, 1976; Divilbiss & Phyllis, 1978; Mick, 1979; Mosborg, 1980).

However, the first studies, which took into account the employee perspective - rest periods, staff meetings and inevitable interruptions - began to appear and publish not until the 1980s-1990s and 2000s, with the development of new public management (NPM) and evidence-based policy (EBP). Then new cost accounting methods, such as activity-based costing (ABC) which was designed in the United-States during the 80's by Cooper and Kaplan (Cooper & Kaplan, 1988) and time-driven activity-based costing (TDABC) which was designed as revised and easier version of ABC by Kaplan and Anderson at the beginning of 21st century (Kaplan & Anderson, 2004; Kaplan & Anderson, 2007) are emerged and adapted also by university libraries. The testing and implementation of the ABC (Goddard & Ooi, 1998; Ceynowa, 2000; Poll, 2001; Ellis-Newman, 2003; Heaney, 2004; Ching & Leung, 2008) as well as TDABC (Pernot, et al, 2007; Stouthuysen, et al, 2010; Siguenza-Guzman, et al, 2013; Siguenza-Guzman, et al, 2014) methods has already reached in university libraries around the world.

Librarians before and since Melvil Dewey have devoted a fair share of time, effort, and pages of literature for finding and reporting more effective ways of getting work done (Logsdon, 1954). The implementation of cost accounting systems in libraries has historically been treated as a technical innovation rather than an organizational or management innovation. The most important consideration is that librarians are not machines which can be set at a given speed and expected to produce a uniform product.

### **The Most Common Methods of Cost Accounting and Timing Research in Libraries**

In library and information science cost accounting research, it is however quite common to measure the time spent by employees on various activities. Efficiency equals results divided by costs, in other words, the efficiency of employees means how much good quality work is being done in as short time as possible. Hence, what are these methods by which this determination is made?

In commercial organizations accountants had discovered, that all elements of operating costs fall into three main categories: labor, raw materials and overhead. In libraries the largest expenses are usually made for overhead, followed by costs for labor and library materials. After total costs have been obtained, these must be analyzed into unit costs – i.e., in case of library work, into cataloguing costs *per volume*

*catalogued*, into circulation costs *per volume circulated*, into bindery costs, *per volume bound* etc. (Rider 1936).

Formal motion and time study, however, goes somewhat beyond the concept of work simplification and streamlining of processes. R. M. Barnes lists four distinct parts to the process, namely, (1) finding the most economical way of doing the job, (2) standardizing the methods, materials, and equipment, (3) determining accurately the time required by a qualified person working at a normal pace to do the task, and (4) assisting in training the worker in the new method (Barnes, 1949, pp. 1-4).

The first formal time and motion study of a library procedure was conducted in 1943 and it analyzed the loan routine at Bradley Polytechnic Institute Library. Today, in the 21<sup>st</sup> century, it seems rather amusing to read that “the right hand did most of the work while the other remained idle – the left hand simply supported the book, while the right hand removed the card from the pocket, handed it to the borrower for signing, stamped the due-date slip, and placed the card in file” (Battles et al, 1943).

It is an important question in traditional cost accounting what is the cost of the offer for certain product or service. In addition to aforementioned, new cost accounting models such as the *activity-based costing-ABC* (designed in the United-States during the 80's by Cooper & Kaplan) and *time-driven activity-based costing-TDABC* (designed as a revised and easier version of ABC by Kaplan & Anderson at the beginning of 21st century) also measure the costs associated with the time spent without using human or material resources.

There is a four-step approach to implement the ABC system (Cooper & Kaplan 1988):

- identify the key activities and relevant cost drivers,
- allocate staff time to activities,
- attribute staff salaries and other costs to activity cost pools,
- determine the cost per cost driver.

In the TDABC model only two parameters are required: (1) the number of time units (e.g. minutes) consumed by the activities related to the cost objects (the activities the organization performs for products, services, and customers) and (2) the cost per time unit. It is important to stress, though, that the question is not about the percentage of time an employee spends doing an activity, but how long it takes to complete one unit of that activity (the time required to process one order, for example how much time it takes to deal with one ILL request - order reception, request handling, transmission of orders) (Kaplan & Anderson, 2004, p. 133). Knowing the real (practical) capacity of the resources used and the time spent on activities, it is possible to find the cost of each activity by multiplying the time spent

on activities with the practical capacity of the resources (Kaplan & Anderson 2007).

According to Ian Brooks (2008), time has always been an important factor in the organization, and it is nowadays being emphasized as an important part of the competitiveness of the organization. Our understanding of time and the usage of time in the working environment has become a key factor. For instance, productivity is an indicator of how much work we are able to perform in a certain amount of time. Time often creates tension between the employer and the employee (for instance, the length of the working day, but also studies conducted by the manager to measure how much time an employee is spending to complete a certain work task) (Brooks, 2008, pp. 160-161).

Ralph R. Shaw (1947) has argued that: "People are at least as important as systems" and recognize that the best schemes of operation require working conditions enabling a staff to enjoy its tasks and take pride in them. The conditions in question concern pay, hours, vacations, privileges, and the like, which are of the same interest to catalogers as to the rest of a library staff, but they also include such essentials as adequate lighting; light-weight book trucks, in sufficient numbers to reduce physical exertion to a minimum; adequate working space; typewriters in good repair, kept so by experts rather than by catalogers; comfortable chairs and other furnishings and supplies designed for the uses to be made of them. People need more than the materialistic things mentioned above. They need incentives, credit when credit is due, and an opportunity to participate in the decisions that affect them" (Morsch, 1954, p. 480).

Specific time studies of personnel activity will give the most precise data about the actual tasks performed. The self-administered diary method is most often employed in historical library cost accounting studies for determining labor costs (Rider 1936, Miller 1937). Time sheets are another very common method for costing purposes, but in that case, time sheet codes need to be developed by the library or department managers to inform decisions they will influence. Chargeable and non-chargeable time must be clearly distinguished. For example, staff communication meetings are clearly non-chargeable time. Their purpose is to keep staff informed and give updates on organizational policies and culture. Professional body conferences, seminars and workshops will all be non-chargeable time. If the staff is attending training courses to develop their work-related skills, the time spent on training will also be non-chargeable time.

However, some organizations who have had experience to recording staff work time, find difficulties when some of their staff book time on to time sheets over above the level of the hours they are contracted to work. For example, Friedman & Jeffreys "Cataloging and Classification Survey in British University Libraries" (1967) shows that "a serious difficulty arose with the determination of the amount of time

spent on the various activities. Library staff was asked to indicate which of a number of given periods of time (hours) they spent on each activity in one week. It was surprisingly revealed that some members of library staff appeared to work longer than a forty-hour week!" (Friedman & Jeffreys 1967).

Despite the Friedman & Jeffreys experience, Diane R. Tebbetts (2007) is convinced that if time studies are conducted on a regular bases, data for cost analyses will be readily available and save much time and actual time sheets or "logs" will provide the most accurate data (Tebbetts 2007).

In 1970s, the methods such as random time sampling with self-observation and interviewing staff with closed questions were added for library cost accounting studies (Spencer 1971, Masterson 1976).

For library activities, identification and definitions, the direct observations, systematic sampling process and the open interviews without the structured questionnaire are the part of new cost accounting models studied in academic libraries (Pernot et al 2007, Stouthuysen et al 2010).

The first step in the case of new cost accounting research usually involves interviewing library staff to identify the main activities performed in the library and the role that each staff member plays in these activities. Library employees usually describe in detail how they perform each of their tasks. The most accurate descriptions can be achieved when library staff members physically perform the tasks while describing them to the interviewer – which may be considered direct observation. From staff descriptions or direct observations the performed tasks will be documented. The need for further interviews or observations depends upon how well the descriptions and documentation match the actual tasks being performed.

Certainly it must be emphasized that all library activities are intellectual activities, which demand knowledge, judgement, and initiative, and every plan to increase the output must take these factors into consideration. Felix Reichmann's (1953) has argued that "librarians, but especially when they are dealing with acquisition and cataloguing or even with bibliographical describing, should have freedom to decide how much time can be spent on the cataloguing or describing of one title, or that the concern is with quality alone not with the quantity of output. A reasonable equilibrium between quality and quantity has to be found, since the acquisitions program of research libraries makes it imperative that close attention be given to the sum total of titles catalogued" (Reichmann, 1953, p. 310).

## Conclusions

Libraries today are included in the general demand for cost transparency and effective cost management. With the data they have traditionally collected, libraries can assess details about the costs of collection building; what they need now

are reliable data about the costs of their services and products. Nowadays, the cost accounting researches in libraries can be also identified as case studies combined both qualitative and quantitative methods – collecting and analysing statistical accounting data, interviewing staff with using semi-structured or open questions, observations, analysis of documentary sources, which is important to supplement as well as to compensate for the limitations of other methods.

The most widely used qualitative methods in work efficiency studies have been the following: 1) observation study, during which an observer records the time necessary to complete a task and computes the output per hour and unit cost for that task; 2) diary study that involves the direct participation of each staff member for data collection: the employee records the beginning and ending time of each task during the designated period of study; 3) interviews with staff to obtain a detailed description of the various sub-systems of the library, and to identify tasks and task elements; 4) work sampling technique, based on a statistical formula involving random observations of the work activities etc. Other methods such as the analysis of staff statistics, annual reports, staff duties, organization charts and various library statistics are also used.

Documentary and statistical evidence acts as a method to crossvalidate information gathered from interview and observation given that sometimes what people say maybe different from what people do. Thus, it is very important regarding the results of such research that the methods, by which the measurements are carried out, have been selected very carefully, without compromising the culture of the specific organization.

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## Curriculum Vitae

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