Cost accounting and scientific management in libraries: a historical overview

Kate-Riin Kont

Institute of Information Studies, Tallinn University, Tallinn, Estonia

Abstract

Purpose – The aim of this paper is to focus on the history of cost accounting, costing, and time and motion studies, which were initially developed for industry and private sector organisations, in libraries. At the same time, the article attempts to deal with the question of when and why the need for the evaluation of costs and the standardisation of different library work processes emerged.

Design/methodology/approach – The data used in this paper are based on reviewing and summarising relevant studies, which have been conducted in libraries, and was inspired by the ideas of scientific management and cost accounting.

Findings – The implementation of cost accounting systems and scientific management ideas in libraries has historically been treated as a technical innovation rather than an organisational 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. Fortunately, there is no indication that production standards for libraries are going to be set up.

Originality/value – This article raises a perspective in library management that has not been dealt with before. Namely, it explores how the profession of a librarian as an erudite scholar changed into a profession requiring routine work and considers the impact that the ideas of scientific management and cost accounting research had on library employees when they reached libraries.

Keywords Cost accounting, Costing, Timing, Library history, Performance management history, Performance measurement, Performance management, Libraries

Paper type Literature review

Introduction

In the library as a service enterprise, performance and effectiveness/efficiency mainly depend on the employees. Thus, if the organisation starts to pay more attention to the optimisation of costs, the work of all employees is considerably affected.

Librarians have not always been satisfied with the performance and effectiveness of their work being measured. For example, Arthur E. Bostwick, President of the American Library Association (ALA) in 1907–1908, and a Librarian in St Louis Public Library, insisted on introducing scientific procedure in library management and was thoroughly caught up in the efficiency movement, despite his staff not being pleased with it. He admitted that when he adopted individual efficiency forms for each library employee (including a rating for whether the librarian had an appreciation of literature) his staff responded to his experiment with “suspicion, distrust and dislike of the whole scheme”. “Wasting time is worse than wasting money,” stated Bostwick (Casey, 1981).

Robert A. Miller (1937) argues:

Efficiency demands that the library organisation be well planned, that functions be well organised, and that operations be grouped as to function. Each process or series of operations
will, necessarily, be routinised to a large extent in the typical library. To one who would seek to know the organisation thoroughly it would seem proper to inquire next if the costs of the routinised operations had been determined and if they had been totalled into a cost for an entire service or for the complete function. With cost of the operation or series of operations determined, it would be pertinent to inquire if maximum efficiency has been reached or if indicated can a complete evaluation of the operation be made (Miller, 1937, pp. 512-513).

Throughout history, cost accounting, and time and motion studies related to the scientific management ideas of libraries have been closely associated with the identification of performance – effectiveness, efficiency and productivity – or, in other words, how efficient is the employees’ use of their work time. In fact, librarians before and since Melvil Dewey have devoted a fair share of time, effort, and pages of literature to finding and reporting more effective ways of getting work done (Logsdon, 1954, p. 401). Cost accounting / costing studies as well as time and motion study methods have been applied for better library service, and/or lower cost.

The purpose of the present article is to give an overview of both the history of cost accounting / costing as well as time and motion studies in libraries related to scientific management ideas (both associated with the efficiency and labour-saving devices) first in industry and manufacturing sector, and secondly in academic and public sector organisations. This article is about how cost accounting and scientific management models have been studied and adapted in libraries between 1877 and 1950. In addition, employees’ attitude on their performance and efficiency measurement in the texts of this period was found and analysed. This article raises a perspective in library management that has not been dealt with before. Namely, it explores how the profession of a librarian as an erudite scholar changed into a profession requiring routine work and considers the impact that the ideas of scientific management and cost accounting research had on library employees.

Library work arrangement prior to cost accounting and scientific management
Librarianship is an ancient occupation, but during most of its history it has lacked some of the major characteristics of a profession. During much of the history of librarianship, there was no mystery of difficult techniques and special skills to be systematically transmitted to initiates. In antiquity, the dignity of the librarian was unquestioned, as librarians were mostly scholars or court officials (Rost, 1990). The Alexandrian librarians were universal scholars. They collected books and original sources; they catalogued and made bibliographies. They also edited and translated books, and wrote their own literature. Similarly, in the Middle Ages, libraries and librarians were considered holy to a certain extent: in the Visigoth church tradition, the inauguration of librarians was liturgically set. Gradually, university libraries grew out of monastic libraries and librarians were expected to familiarise themselves with different branches of science. The profession of a librarian-scientist emerged and it was common for libraries to be led by outstanding scientists (Rost, 1990).

Early points-of-view on the profession of the librarian can be found in the paper of Lloyd Smith at the 1876 ALA (American Library Association) Conference (Smith, 1876). A discussion on the librarian as a scientist was a viewpoint expressed by John William Wallace in his opening remarks. Smith saw the librarian as a traditional gentleman scholar, a lover of books, aristocratic, steeped in classical and foreign
languages and sensitive to the problems of scholarship. He says: “A librarian should be not only the walking catalogue, but a living encyclopaedia. A librarians’ evenings should be spent in reading, so that he may keep abreast with the literature of the day” (Smith, 1876, p. 70). Wallace saw the librarian as a “valuable minister to letters” who stood between the worlds of authors and readers. He says: “Librarian’s profession belongs to the sciences. The time has arrived for a new science – bibliothecal science, a wide science, a difficult science, a science of value” (Wallace, 1876, p. 95).

In the European view, the librarian was originally a scholar in the truest sense of the word, a connoisseur of books, who was fully familiar with the content and form of the books in his care, who knew every bit as much about how they came into being as he did about their authors and their authors’ works (Raabe, 1984, p. 282).

For a long time, the management of libraries did not pay attention to such areas of librarianship as the development of 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 did not demand very sophisticated approach to the ways of doing things (Coney, 1952, p. 83).

Due to the rapid increase in the number of books in libraries starting from the second half of the nineteenth century (with the expansion and growth of libraries in the second half of the nineteenth century), librarians needed to re-evaluate their profession. Thus, the librarian-scholar became a librarian-service-provider. A need emerged for numerous educated employees who would be willing to work for an average or low salary (Rost, 1990). The heads of large university libraries were still scholars, but the earlier significance of the profession eroded as the work became more routinised and the opening hours of libraries were extended. In order to locate needed books from large collections, the card catalogue system was implemented. In addition, to aid the orientation of scientists in university libraries and to find needed books faster, the system of referents was set up.

Several highly influential and innovative figures in librarianship appeared during the nineteenth century. Justin Winsor was appointed the Head Librarian at Harvard University in 1877. He brought about evolutionary changes and a new role for the library. He was recognised as a scholar, innovator, national leader in professional concerns, and builder of the Harvard University Library (Hamlin, 1981, pp. 50-56).

In 1883 Melvil Dewey became the Head Librarian at Columbia University. His approach there has been described as “revolutionary” (Hamlin, 1981, p. 49). Some of the changes he implemented were (Hamlin, 1981):

- extending library hours from ten per week to 84;
- permitting students to access the shelves;
- invention of the card catalogue system for locating materials;
- lecturing on the use of the library;
- organising the first reference department to “counsel and direct readers”; and
- instituting a suggestion box to obtain feedback.

During his tenure, the acquisitions budget doubled, the personnel budget quadrupled, and book circulation increased by 500 percent. “His initiatives were being copied by other academic (and public) libraries across the country and around the world”
According to Marion Casey (1981), Dewey’s writings indicate an interest in efficiency and labour-saving devices from the time he designed his classification system in 1873. Long before Frederic Taylor was prominent, Dewey had respect for the engineer’s approach to problems. Slight improvements in working habits, he wrote, “...will readily add ten percent to efficiency. In a working life of fifty years, five full years!” (Casey, 1981, p. 26).

In fact, there is exact evidence that Taylor himself and his colleague Morris L. Cooke, were impressed enough by Dewey’s library classification system to model industrial classification systems on Dewey’s. Cooke (1929, p. 119) stated: “Carl G. Barth is my authority for the statement that the enormous number of accounts ... of the Pullman Car Works were designated by number so arranged as to be largely mnemonic, along the lines of the Dewey system”. Frank B. Copley states in his Frederick W. Taylor, Father of the Scientific Management (Copley and Frederck, 1969, p. 354): “It would appear that all the industrial systems of classification and symbolisation, including Taylor’s, owe much to the Dewey decimal system, well known from its use in libraries.”

Archibald Cary Coolidge became the Director of the Harvard University Library in 1910. He formulated a vision of what the library should be. He identified his priorities as addressing a patchwork cataloging and classification system, and building a quality collection. He provided vision and leadership and also encouraged teamwork and shared responsibility. Coolidge “helped make the library an essential part of the university organisation, an intellectual symbol of the university” (Byrnes, 1982).

Gradually, library managers developed the need to ask themselves some specific questions, such as what does it cost:

- to acquire (order and purchase) a book;
- to catalogue a book;
- to refurbish a damaged book or to bind annual volumes of a periodical in the library’s bindery;
- to receive, check, and distribute an issue of a periodical; and
- to provide reference services, etc.

By the end of the nineteenth 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 organisations, be it a university (in the case of a university library) or a local government (in the case of a public library).

A need arose for standardisation of different tasks in library work to bring production to a higher level, and to assure that human labour will be used in a worthy way. Standardisation was an important means for inspecting the output, so that gradually the best methods and processes could be chosen. And opinion developed that unless the units of performance or elements of processes were standardised to some extent, it would be impossible to make comparisons within one’s own institution or with others (Duyvis, 1954, pp. 410, 412).

However, there was good reason to assume that librarians, like many other professional groups with a long and dignified history, are sensitive regarding the values of their traditional ways and would be slow to accept changes (Coney, 1952, p. 84).
Cost accounting, scientific management ideas and libraries

Scientific management concept began to develop at the end of nineteenth century and became particularly popular in the 1930s and 1940s, when large governmental and industrial organisations emerged. As mentioned in the previous section, libraries, especially university libraries, were also growing during that time, and library administrators sought techniques used elsewhere, which might help them administer libraries that were becoming increasingly complex (Lynch, 1979, p. 261).

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

Cost accounting, as defined in the Encyclopædia Britannica, is “a system of accounting designed to show the actual cost of each separate article produced or service rendered” (Rider, 1936, p. 332). This was a joint venture of the public and private sector. Cost accounting is, in its essence, the process of tracking, recording and analysing costs associated with the activity of an organisation. Through cost accounting, output indicators are incorporated into the financial system (Doore Van et al., 2010, p. 40). After total costs have been obtained, these must be analysed into unit costs – i.e. in the 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, p. 336).

Accounting historians agree that cost accounting is also a consequence of the industrial revolution. The first modern business organisations to require internal accounting information for decision-making and control, were the mechanised, multi-process, cotton textile factories that appeared in England and the US around 1800. These textile factories used cost accounts to ascertain the direct labour and overhead costs of converting raw material into finished yarn and fabric (Johnson, 1981, pp. 510, 511).

However, in H.G.T Cannons's (1910) Bibliography of library economy: a classified index to the professional periodical literature relating to library economy, printing, methods of publishing, copyright, bibliography, etc. neither the term “cost accounting” nor any synonym of it appears at all. A few references to the cost of cataloguing appear under the heading “Cataloguing”.

The scientific management principles do not represent a particularly revolutionary departure from library thinking. Library administrators have long been aware of the need for increased efficiency and greater economy and have profited from applying to library operations other techniques and principles developed in industry –, e.g. accounting in terms of unit costs (Battles et al., 1943, p. 241). Although the first research briefs appeared in the US magazine Library Journal already at the end of nineteenth century, the first contemplations about the adjustment of cost accounting (which have been used by commercial organisations for a long time) in library management appeared at the beginning of the twentieth century. A Survey of Libraries in the US (1927) reads as follows: “The reason large commercial organisations find it
necessary to keep exact accounting systems is that they are generally operated for profit and must have income as well as outlay." However, since libraries are not operated at a profit, is it true they have no interest in reducing, where possible, their operating costs? Speaking of one specific phase of the question on library costs, Paul N. Rice (1927) well says: "The problem of cataloguing costs must be attacked by cataloguers themselves or it will be attacked by executives less able to judge fairly as to what should be modified or eliminated" (Rider, 1936, p. 333).

Hence, what does cost accounting seek to accomplish in libraries? As Fremont Rider (1936) argues:

A satisfactory system of cost accounting assists the management to reduce working costs by pointing out waste and avoidable delay, to choose wisely between alternative methods of operation or production. It is the best possible safeguard against leakages. It stimulates work interest and competitive endeavour. There remains, however, an idea that library work is in some way so different from all other forms of organised human activity that even the basic principles of accounting do not apply to it. Nothing, of course, could be farther from that fact (Rider, 1936, p. 333).

Scientific management is inseparable from the technique of time and motion study. The man, generally regarded as the father of scientific management, Frederick W. Taylor, developed the early methods of time and motion study for measurement of industrial production (Hayes, 2001, pp. 2-3). Taylor divided work into units and single operations and recommended standardising work. Each job was to have a standard time determined by time studies made by experts (Niebel, 1988). Subsequently, Frank and Lillian Gilbreth, with their definition of a therblig as a component motion in a manufacturing operation, refined and extended Taylor’s methods (Hayes, 2001, pp. 2-3). The Gilbreths’ work focused on inefficiency and waste – not only on the waste of time and motion, but also on the waste of potential human satisfaction and fulfilment that could be derived from work (Niebel, 1988, pp. 15-16). 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 (Barnes, 1949, pp. 1-4):

1. finding the most economical way of doing the job;
2. standardising 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.

By the end of the nineteenth century, library managers were ready to apply useful management techniques in their libraries. At the end of the nineteenth century and at the beginning of the twentieth century, many libraries were identified as being large enough to apply the ideas of scientific management and cost accounting. Librarians in these libraries were interested in achieving maximum efficiency at minimum cost. They accumulated data on unit costs, particularly costs associated with cataloguing and processing of materials (which amounts to a large part of the library’s budget), in order to identify ways that would reduce these costs. Both cost accounting studies as well as time and motion studies were undertaken regularly to create efficiencies in library operations through time reductions (Lynch, 1979, p. 262).
It is difficult, actually impossible, to parallel the history and ultimate causes of measuring the effectiveness of library work with those of measuring the effectiveness of some other kind of so-called “soft” institution, for instance, with measuring the effectiveness of academic institutions. The reason for this lies in the fact that the staff of universities preserved academic freedom (which was taken over as a model from German universities already in 1890 – for example, the University of Chicago and the California Institute of Technology –, although officially only in 1915 did the newly formed American Association of University Professors issue their first report on academic freedom (Metzger, 1988)). The effectiveness of their teaching began to be evaluated and measured in the beginning of the twentieth century. For example, Morris L. Cooke, a member of the American Society of Mechanical Engineers, was sent by the Carnegie Foundation to discover, whether the best use is made of the large staffs of American universities, the Carnegie Foundation. Cooke visited several universities, and reported on their organisation from the businessmen’s point-of-view. The first point that was taken up is what Cooke called “the lack of intensiveness”. Cooke pointed out that the work efficiency or inefficiency of one department may actually interfere with the efficiency of another. For Cooke, a research-dominated system was inefficient because faculty scholarship had little relevance to undergraduate education. Cooke believed that the manager has a responsibility to motivate and train employees. For universities, he translated this criterion into a duty to develop and reward effective teachers (Schachter, 1991). Cooke also complained about the management of students and discipline, compared the cost of teaching and research at the institutions he examined, and asked the warrant for the large amounts spent on the latter (The New York Times, 1910).

In the second half of the nineteenth century, the effectiveness and performance of the public sector was also attended in the USA. The implementation of scientific management ideas was made obligatory in the US public sector organisations, when the 1910 Taft Commission on Economy and Efficiency, which was significantly influenced by the above mentioned ideas, aimed at improving the executive management and performance of government (Heinrich, 2003, p. 25). This turned out to be a misjudgement, as several work processes (specifically, brainwork) were and have always been rather difficult and often impossible to evaluate in the public sector. Theoreticians of scientific management school also neglected the activation of employees and the expansion of organised labour. Establishing an ideal steady position in the public sector failed in the beginning of the twentieth century.

Library employees’ and activities’ performance measurement as a research topic
Keyes Metcalfe, a Harvard University librarian emeritus, mentioned the earliest known study on the cost of cataloguing in a library in “Attitude of the Library Administrator toward Cataloguing”. He tells the story of how, after the British burned the Capitol, including the Library of Congress in 1812, Thomas Jefferson sold his 6,000-volume library to Congress for $23,000. After the books were catalogued, the Congress complained about the high cost of cataloguing. This incident yielded one of the earliest figures on cataloguing costs in the USA and probably the first recorded protest over the high costs of cataloguing (Harris, 1989, p. 1).
The first reports of the results of library cost accounting studies appeared in writing already in the second half of the nineteenth century, and notably, in America. The first reference to library cost accounting in professional literature appears to have been in the very first volume of the *American Library Journal* in 1877, where Charles Cutter, in reply to an inquiry, estimated “the cost of cataloguing” for an unnamed large library to be $0.40 per volume and for an unnamed small public library to be $0.16 per volume (Cutter, 1877, p. 219). Cutter’s report was a reaction to the letter of Dr H.A. Hagens, published in the 18 January edition of a newspaper, *Nation*, of the same year, where Hagens criticised the existing management system and work arrangement in American libraries, implying that libraries were not serving the public as well as they should and that they spend excessively on maintaining various card catalogues (author and theme catalogues). According to Cutter’s estimation, a million dollars was being spent to compile and maintain the card catalogues of three Boston libraries, which, to Cutter’s, mind was a sum too large. Cutter says: “There seems to be a vague impression abroad that librarians have invented the catalogue as a sort of toy to amuse themselves with, a diversion for the many leisure hours which they are supposed to have (Cutter, 1877, pp. 216, 217).

James L. Whitney (1885), Director of the Boston Public Library published *On the Cost of Catalogues* in which he estimated the entire cost of cataloguing – preparing a volume for the shelves, including accessioning and ordering per volume. According to Whitney (1885, p. 214):

> It is not necessary to say to librarians that there are two things which should be kept distinct: first, the expense of a new book in its passage from the bookseller to the library shelf; and, second, the cost for the proper care of the books already in a library and for making them known to the public.

In addition, Whitney (1885, p. 215) also notes:

> Those in charge of the catalogue will naturally fall the duty of helping readers. Many thousand persons seek aid every year in finding books and advice in their selection. Every mail brings some question to be answered. All this, and much other outside work, is sometimes charged to the account of catalogue expense.

Although Whitney’s paper aroused considerable discussion when it was presented, apparently no further interest in the subject developed and another fifteen years passed before Dr Steiner presented a paper on the cost of preparing library books for public use in 1900. This paper showed some technical progress. It at least pointed out some of the difficulties that should be encountered in determining library costs (Rider, 1936, p. 342).

In 1905 William Warner Bishop of the Princeton University Library contributed a noteworthy paper, *Some Considerations of the Cost of Cataloguing*, which, for the first time, offered the beginning of a firm basis for procedure. Bishop suggested, for instance, that there were elements of cost, other than labour involved in cataloguing, such as different salaries, different costs of heating and lighting in different regions and buildings, and different thoroughness and extent of the actual work with different systems. Bishop was the first librarian to state in print that comparative cataloguing cost studies were unsatisfactory, saying: “Cost studies have little value, because there are too many varying processes and practices involved in different libraries for the comparative cost studies to measure the same thing.” Bishop also analysed the
statistical factors involved and clearly showed the necessity of securing agreed definitions of terms for comparison of the results (Rider, 1936, p. 343; Harris, 1989, p. 9).

These early studies indicate that one of the main reasons why cost accounting reached libraries was the need of library managers to justify their costs – both to the public as well as to their parent organisations – which, however, was seldom easy. Critics seemed to think that investment in the cataloguing system was a dead loss. In addition to cataloguing costs, the work (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.), which did not seem to involve costs in the eyes of the public, had to be justified.

If there is any country in the world in which time is money, and therefore worth saving, that country is the USA. The Grand Rapids Public Library (USA) was the first library institution where cataloguing was measured in the terms of time spent in 1914 (Reichmann, 1953, p. 291). The library was the one of the participants in the American Library Association’s (ALA) cataloguing test of 1913–1916. Titles were designated as production units, cataloguing was broken into 13 operations, and costs were calculated both in the time spent as well as in dollars and cents. The study highlighted for the first time the importance of salaries as another factor that influences the cost of work. There are other factors, too, that influence the time consumed on cataloguing and, thereby, the cost of work: matters of organisation and the experience and alertness of workers, the absence of which will naturally result in the waste of time (Rider, 1936, pp. 343-344; Harris, 1989, pp. 9-10). The organisational committee of this study reported: “Today the library must emulate the business organisation in employing the cheapest grade of labour where it can be used and using its highest priced labour only for strictly professional work.” In addition, the committee said, “Each member of the staff should be doing the most advanced work for which she is equipped” (Morsch, 1954, p. 474).

Although the reaction of employees to the increased attention given to their time usage was not discussed in the study, this marked the beginning of a new stage in the history of cost accounting research. The librarian was no longer 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.

During the 1920s and 1930s, the idea that cataloguing costs could include other parameters besides wages and salaries of cataloguers became more prominent.

In 1924, a study to determine the cost of cataloguing at the University of Illinois revealed six factors that should be included in calculating true cataloguing costs (Reichmann, 1953, pp. 292-293; Harris, 1989, p. 10): administration; equipment; conditions of work; hours of work; procedure; statistics; and cooperative cataloguing.

Note that only cataloguing costs are mentioned in all these early references, probably because it has always been the most costly part of the library work and library managers are constantly looking for ways to cut these costs. Lucile M. Morsch (1954) says:

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 (1936) in Wesleyan University, Middleton, Connecticut, focused on the idea that administration and overhead should be calculated as part of cataloguing costs, by which Rider meant the rent or the cost of housing the catalogue department, heating, lighting, water, telephone costs, printing, stationery and postage, depreciation, insurance, janitorial services, and building repairs (Rider, 1936; Harris, 1989, p. 10).

Unless employees worked at the Wesleyan Library on a piecework basis, which was very seldom, even during these days, labour cost was measured in the units of time, which then was translated into dollars and cents. To measure labour time, the most common and simple cost system was used: to have each member of the staff account for his or her own time. Each of the staff members was required to record on his or her sheet what they did during every 15-minute period of their working day, according to a definite functional analysis of all the library work, which was printed in summary form on her time sheet. The authors of the study warn that in and of itself no cost system can cut costs. All it can do is to show the administrator where costs could be cut (Rider, 1936, p. 355).

Rider (1936) was the first scholar to draw attention to employees and their possible feelings and opinions relating to the measurements of the effective use of their working time, arguing:

There are intangible factors in the work of the librarian that no cost accounting system can ever reach and library staffs cannot, factory-wise, grind out a standardised product – and be worth their salaries. An important point in library cost accounting will be almost entirely free of one difficulty that has always been one of the chief problems of the business cost accountant, viz., the ignorance, antipathy, and, occasionally, the actual dishonesty of employees in the keeping of their cost records. For library staff members are about as intelligent and loyal a class of employees as can well be imagined, and their enthusiastic and interested co-operation in any form of cost accounting undertaken may be taken for granted (Rider, 1936, pp. 379, 337).

While library literature contains many examples of cost studies and reports of time devoted to different phases of the library operation, there have been only few applications of time and motion study technique in the formal sense. In fact, many of these studies actually exist only as manuscript materials (for example, Jewel C. Hardkopf’s and Watson O'D. Pierce’s studies from 1949, refereed by Logsdon, 1954).

Richard Logsdon (1954) credits Emma V. Baldwin and W.E. Marcus with the first industrial motion study process chart to appear in library literature. Their study, published in 1941, was designed to establish measuring rods for the evaluation of library service. Deductions and conclusions are based on data from thirty-seven public libraries, reporting the experience of 1,560 individuals in the daily performance of work for a four-month period. It is a time study in the sense that the apportionment of staff time to the major functions of library service is presented (Logsdon, 1954, p. 401).

As known to the authors, the first formal time and motion study of a library procedure, analysing loan routine at Bradley Polytechnic Institute Library, was conducted in 1943. The subject for analysis was part of the circulation routine – loaning a book to a reader. The following steps in the routine of loaning were observed:

- determining whether the book is in the library;
- bringing the book to the desk; and
- checking the book out to the borrower.
A more detailed analysis was made in the case of step three, as the method employed was the microfilm analysis, or study of the activity by minute division, using motion pictures. After the operation was photographed, the film was run through a motion picture projector equipped with a remote control, permitting the film to be run at various speeds, or to be reserved or stopped for more careful study of certain parts of the picture. The motions of the library assistant recorded on the film were broken down into therbligs, and a tabulation was made of the time required for completing each therblig, as measured by the micro-chronometer. From this tabulated analysis, a simultaneous motion chart was prepared. These simo charts had parallel columns for two hands, divided into uniform time units. The chart graphically shows the operations performed by each hand and the time required for each operation. Today, in the twenty-first century, it seems rather amusing to read:

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.

It was suggested that the due date slip should be placed on the inside of the back cover and the card pocket on the back flyleaf, as near to the top of the page as possible. The book can then be handed to the borrower with the left hand, and the card received from him with the right hand, and placed in the file. The authors of the study suggest similar analyses of other library routines, such as ordering and cataloguing of books and their preparation for use (Battles et al., 1943).

Wheeler’s survey of acquisition and cataloguing department policies at the San Diego Public Library (1949) included before-and-after motion charting and diagramming of the clerical processes, although the charts were not published (Logsdon, 1954, p. 404).

In 1949, library management analyst and consultant Jewel C. Hardkopf reported the results of applying methods and motion techniques to the processing of books for circulation at the New York Public Library. Over and above presenting findings, this report is of interest for reviewing the historical development of methods and motion study; analysing the techniques used; and reviewing previous reports on methods and motion studies as applied to libraries. When referring to the work of Battles et al. (1943) and his associates at the Bradley Polytechnic Institute, Jewel Hardkopf points out that the approach “should have opened a new era in the realm of library housekeeping. But there is nothing more in library literature to date about further application of methods and motion techniques to library processes” (Logsdon, 1954, p. 402).

The study by Watson O'D. Pierce (1949), Work Measurement in Public Libraries; a Review and Manual on Time Studies and Work Units with a Statistical Analysis and an Evaluation of Administrative and Management Procedures in Certain Public Libraries, presents a mass of data and interpretation commensurate with the somewhat extended title. This significant paper describes in detail how time measurements can be made by the staff of a public library, outlining preliminary stages of training and preparation, the orienting of library personnel to measurement studies, and the method of analysing the results (Logsdon, 1954, p. 404).

The most extensive management study of an individual cataloguing establishment found was the survey carried out at the New York Public Library during the fiscal year 1951–1952 on acquisitions and preparations of the material for lending. The study was
based upon personal conferences with the staff, job analysis, charts, manuals, and reports previously made, visits to other libraries, and a review of library surveys. Each step in the procedures examined was considered to determine whether it was necessary at all, and whether it was being performed by the right person and at the right time in the process. Time tests were run on a selective basis. These studies cover acquisitions and preparations, respectively, paying attention to organisation, staffing, management controls (including the flow of work), and such physical factors as location, layout, and furnishing. One outstanding feature of this survey was the emphasis placed on staff participation in the consideration of the report, and in the acceptance and installation of most of the recommendations (Morsch, 1954, pp. 479, 480; Ottemiller, 1954, p. 446).

Time and motion studies in libraries did not only measure the performance of individual worker, but also dealt with such matters as work simplification, salary standardisation, determination of 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 the careful definition and assignment of work in each department. Work definitions were expected to facilitate the measurement of performance. They fixed responsibility of performance, and influenced the hiring and assignment of personnel (Lynch, 1979, p. 261).

An employee’s performance measurement: the staff’s perspective

Some authors in library and information science have analysed the elements of job attitudes, job satisfaction and their relationship to performance output (Siggins, 1992; Sullivan and Bhatagan, 1992). For almost 50 years, the common assumption among managers and researchers has been that a happy worker is a good worker. Although this seems a very appealing idea, the results of empirical literature are too mixed to support the hypothesis that job satisfaction leads to better performance, or even that there is a reliable positive correlation between these two variables. On the other hand, some researchers argue that the results are equally inconclusive with respect to the hypothesis that there is no such relationship. One view, associated with the early human relations approach, is that satisfaction leads to performance. An alternative view is that performance leads to satisfaction. However, a variety of studies suggest that research has found only a limited relationship between satisfaction and work output and offer scant comfort to those seeking to confirm that a satisfied worker is also a productive one (Siggins, 1992; Sullivan and Bhatagan, 1992).

Ralph R. Shaw has said: “People are at least as important as systems.” He recognised that the best schemes of operation required working conditions enabling a staff to enjoy its tasks and take pride in them. The conditions in question concern pay, working hours, vacations, privileges, and the like, which are of the same interest to cataloguers as to the rest of a library staff, but they also include the following essentials: 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 cataloguers; 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” (cited in Morsch, 1954, p. 480).

There were some authors who did not believe that substantial shortcuts in cataloguing would be economically effective. For example, according to J.C.M. Hanson (1934):

An honest and experienced librarian is not satisfied to meet the demand for reduction in cataloguing costs by claiming that he has succeeded in cutting the costs 25 cents per title, when the reduction had been achieved by omissions and curtailment which must necessarily reduce the efficiency of the catalogue and place additional burdens on other divisions of the library, notably the service department — not to mention the public.

In Andrew Osborn’s (1941) opinion:

Cataloguing for example, is an art, and as an art they are technical. Their basic rules are actually rather few and simple, and, in so far as the rules are kept few and simple, they are a delightful art to practice. But that is the romanticist point-of-view. A period of romanticism tends to be followed by a period of classicism with its subservience to rules, and this is what has been happening to cataloguing. More and more rules and definitions are being worked out constantly, until at the present time it begins to appear that classicism is taking full control. Thus, it is that cataloguing has become elaborate, highly technical, a skill too often existing in and for itself (Osborn, 1941, pp. 394-395).

Fortunately, there is no setting up the standards of production for libraries. Some report work experiences, but many are opposed to “any production quotas in any department of the library because it would interfere with the flexibility of work assignment and would be resented by the library staff”. It would be unrealistic to multiply the norms by the number of hours in a workweek and to assume a corresponding output. Rest periods, staff meetings, and inevitable interruptions are bound to make an appreciable dent in the hours of work. The most important consideration is that human beings are not machines, which can be set at a given speed and be expected to produce a uniform product. The best results will be achieved by an understanding supervisor who has the confidence and the respect, and therefore the loyalty of the staff (Reichmann, 1953, pp. 309-310).

It must be emphasised that all library activities are intellectual activities, despite the opinion of Andrew Osborn (1941), 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:

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
Consider the work arrangements in libraries in the Antiquity and the Middle Ages, where librarians were, first and foremost, scholars, and organised their own work and time usage, we should not be surprised that getting used to the new, more effective working methods took time and librarians were not interested in increasing the
effectiveness, efficiency and productivity of their work at a time when ideas of cost accounting and scientific management emerged. Scientific management principles did not represent anything new in library thinking. In fact, there is exact evidence that both Taylor himself as well as Morris L. Cooke, too, were influenced by the Dewey’s library classification system.

The objective of the early cost accounting and timing studies that were conducted in libraries in terms of time spent, was to increase the efficiency of library work, that is to simplify and clarify the organisation structure; to provide stronger supervision and control; to provide greater flexibility and assure better utilisation of each member’s highest skills; to improve office location, layout, and furnishings in order to facilitate supervision; and to provide a more comfortable working environment.

The next decades showed that the social needs of the employees cannot be ignored. The practitioners of the art and science of time and motion study came to realise the necessity of considering the human element and, thus, the need for surveys with more social aspects emerged. In the 1930s and 1940s, experts in scientific management already put less emphasis on mechanical means of increasing production and more on discovering the potential of human beings.

An overview of the literature of this period could be summarised as follows.

- Attempts were made to determine the standards of performance, whether of books ordered, catalogued, or circulated, or cards typed or filed. Specific operations were timed, and staff and individual averages arrived at.
- The work of each library department was clearly defined. This facilitated measuring accomplishment, places responsibility for it, and immediately affected hiring and assigning of employees.
- Personnel policies, codified as rule-of-thumb measurements, were replaced by more definite standards, and personnel work was centralised in a single office.

The scientific management movement followed from placing an emphasis on rationality in the organisation and disregarding the feelings of the employees. All in all, the history of the development of cost accounting and scientific management can be seen as a natural evaluation of techniques, which were created to solve management problems.

Whereas the hypothesis that job satisfaction leads to better performance have found no direct confirmation, studies about library staff attitudes towards the concepts of effectiveness and efficiency, as well as about their attitudes towards measuring their work performance, would be entirely relevant. Such studies would certainly help to identify staff suggestions and proposals on how to make their work more effective and efficient. Today a number of theories and paradigms have been developed to manage, analyse and study the organisation and its activities. However, simple scientific management-based solutions still appeal to many managers. The principles devised by Taylor changed organisations and are still being applied in most of them, including libraries. The management should consider the positive aspects of scientific management and look at the human aspect of their managing style in the light of the ideas of the human relations school.

Why was – among institutions that represent so-called “soft” professions – regular measurement of effectiveness, using cost accounting and time and motion studies’ techniques, so well implemented in libraries, but not a convention in universities and
public sector organisations? Though library work also requires professional education, wisdom, creativity and the independence of thought, the libraries were turned into service organisations by the end of the nineteenth century, being support structures for both the universities as well as the public sector. Library staff became involved in a routine work, their task being to provide quality and, at the same time, as effective and efficient as possible, library service to universities (in the case of university libraries) or to the general public (in the case of public libraries).

References

Further reading

Corresponding author
Kate-Riin Kont can be contacted at: kont@lib.ttu.ee

To purchase reprints of this article please e-mail: reprints@emeraldinsight.com
Or visit our web site for further details: www.emeraldinsight.com/reprints