



Article

**Activity-Based Costing (ABC) and Time-Driven Activity-Based Costing (TDABC):
Applicable Methods for University Libraries?**

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Abstract

Objective – This article provides an overview of how university libraries research and adapt new cost accounting models, such as “activity-based costing” (ABC) and “time-driven activity-based costing” (TDABC), focusing on the strengths and weaknesses of both methods to determine which of these two is suitable for application in university libraries.

Methods – This paper reviews and summarizes the literature on cost accounting and costing practices of university libraries. A brief overview of the history of cost accounting, costing, and time and motion studies in libraries is also provided. The ABC and the TDABC method, designed as a revised and easier version of the ABC by Kaplan and Anderson (Kaplan & Anderson 2004) at the beginning of the 21st century, as well as the adoption and adaptation of these methods by university libraries are described, and their strengths and weaknesses, as well as their suitability for university libraries, are analyzed.

Results – Cost accounting and costing studies in libraries have a long history, the first of these dating back to 1877. The development of cost accounting and time and motion studies can be seen as a natural evolution of techniques which were created to solve management problems. The ABC method is the best-known management accounting innovation of the last 20 years, and is already widely used in university libraries around the world. However, setting up an ABC system can be very costly, and the system needs to be regularly updated, which further increases its costs. The TDABC system can not only be implemented more quickly (and thus more cheaply), but also can be updated more easily than the traditional ABC, which makes the TDABC the more suitable method for university libraries.

Conclusion – Both methods are suitable for university libraries. However, the ABC method can only be implemented in collaboration with an accounting department. The TDABC method can be tested and implemented by separate departments, and thus can contribute to the provision of better and more effective library services at lower costs. However, the involvement of experts in costing and accounting is recommended.

Introduction

In economically stable times, little attention is paid to effectiveness, but in hard times, it becomes essential. Therefore, reassessment of activities and reforms, caused by the recent financial crises, aim to save money and improve work performance in the public, as well as in the private sector.

Public sector organizations may have less incentive for efficiency, and this is related to the principle of budgetary control. Indeed, a public organization's budget does not depend on the efficiency and performance of the organization. Because of this lack of control, public sector organizations were seldom interested in saving their budgetary funds. If an organization or its department strove to be financially effective and economize, this may well have resulted in a lower budget for the next year.

In the current socioeconomic situation, efficiency and performance have become imperative. The challenge is to cope with the same or reduced resources in managing the same processes and activities, ensuring that the quality of the service and its results are not affected.

According to ISO 2789:2006, the operating costs of libraries should be classified as follows: personnel costs, acquisition costs, interlibrary loan costs, collection maintenance costs, administrative costs, and other costs. Personnel costs are considered to be the largest item of expenditure for libraries, followed by acquisition costs, administrative costs and other costs. Libraries, therefore, have known precisely into which categories the costs belong, but lack a specific overview of the activities between which these costs are divided. Even if they have had precise knowledge of how much money was spent, for example, on each acquired publication, it has been very difficult to determine the entire cost of acquisition and cataloguing. Personnel costs related to the processing of an acquired publication have not been added to the purchase price of the publication.

Libraries today must respond to the general demand for cost transparency and effective cost management. Libraries can assess in detail the cost of collection building, relying on the data they have traditionally collected. What they need now is reliable data about the cost of their services and products. In order to obtain precise information about the actual expenses related to different work processes in libraries, managers have looked towards

methods that were originally developed for industry and private sector organizations.

Literature Review

In the past, library managers paid little attention to such areas of librarianship as the development and 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 a very sophisticated approach to the ways of doing things (Coney, 1952, p. 83).

By the end of the 19th 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 budgets and costs to their parent organizations, be it a university (in the case of university libraries) or a local government (in the case of public libraries). Library managers were ready to start to apply new management techniques in their libraries, many libraries being large enough to apply the ideas of 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 the cataloguing and processing of materials (which amounts to a large part of a library's budget), in order to identify ways to reduce these costs. Cost accounting studies, as well as time and motion studies, were undertaken on a regular basis so as to create efficiencies in library operations through time reductions (Lynch, 1979, p. 262).

Early studies and reports of 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. However, this was seldom easy. Critics seemed to think that investment in the cataloguing system was wasteful. 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, and replying to written enquiries, which did not seem to involve costs in the eyes of the public, had to be justified.

The first library institution in which cataloguing was measured in terms of time spent was the Grand Rapids Public Library (USA) in 1914 (Reichmann, 1953). The organizational committee of the study reported: "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." It added: "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 was no longer a scholar with independent time use, but was transformed into an employee performing routine work, from whom, in addition to accuracy and thoroughness, speed and productivity in performing tasks was required.

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 have been constantly looking for ways to cut these costs. Lucile M. Morsch (1954) has said: "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" (p. 479).

A study carried out by Fremont Rider in Wesleyan University, Middleton, Connecticut in 1935 focused on the idea that administration and overhead, 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, should be calculated as a part of

cataloguing costs. The author of the study warns that no cost system itself 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 the 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 the different phases of library operation, there have been only a 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, referred to by Logsdon (1954)).

Time and motion studies in libraries did not only measure the performance of individual workers, but also encompassed 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, and 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, 1979, p. 261).

In the 1960s and 1970s, 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 labour market and job performance. Job performance evaluation makes it possible to assess positions and employees' work, that is, work performance (Türk, 2005). Although a

number of theories and paradigms were developed to manage, analyze, and study organizations and their activities, the principles devised by Taylor 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 & Self, 1978; Mick, 1979; Mosborg, 1980). However, the first studies that took into account the employee perspective – rest periods, staff meetings and inevitable interruptions – did not appear until the 1980s-1990s and in the 2000s, with the development of new public management (NPM) and evidence-based policy (EBP). At that point, new cost accounting methods, such as activity-based costing (ABC), which was designed in the United States during the 1980s by Cooper and Kaplan (1988), and time-driven activity-based costing (TDABC), which was designed as a revised and easier version of the ABC by Kaplan and Anderson at the beginning of the 21st century (2004; 2007), emerged and were adopted and adapted by university libraries.

ABC, TDABC and University Libraries

The dependence on local government and state finances, as well as the increasing prices of publications, electronic databases, and other materials, have influenced the library and information sector in both positive and negative ways since the 1980s (Roberts, 2003). Libraries have traditionally offered their services free of charge. New services based on expensive licence fees make it economically difficult for libraries to serve with limited and shrinking resources, when price increases exceed the annual increase of library budgets (Haarala, 2004). In the 1990s, savings in staff and in information resources became common. Downsizing staff was, and still is, a painful operation – civil servants were laid off, and voluntary vacation was recommended. The lack of funding for staff was evident, and action was needed (Haarala, 2004). To get a better picture of the activities that libraries are actually engaged in and their cost, studies using new cost accounting/costing models in libraries around the world have become

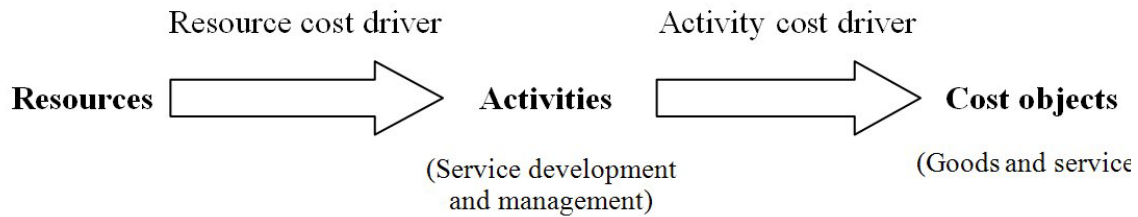


Figure 1
The structure of the Activity-Based Costing System.

common. Constraint on public funds and a shift to an enterprise culture have undermined the tradition of the free provision of services. However, this has also encouraged a climate of innovation and so gained new potential and momentum (Roberts, 2003).

The activity-based costing (ABC) method is the best-known management accounting innovation of the last twenty years (Wegman, 2009). It was originally used in the manufacturing sector in response to dissatisfaction with traditional management accounting techniques that rely on volume-based methods for allocating overheads to products. According to T. A. Spedding and G. Q. Sun (1999), these methods are highly inaccurate in the modern manufacturing environment. Today, much of the significant cost in producing an item is not volume related (for example, the cost of engineering, order processing, planning, and quality control for high technology, made-to-order products, or just-in-time delivery). The ABC, however, takes into account the cost incurred at the activity level and then attributes the cost to products according to the activities that a product goes through (Spedding & Sun, 1999, p. 291).

The ABC is a logical approach to the management of the organization, which helps to clarify and to assess an organization's processes and identify their cost (Ellis-Newman, 2003). The idea behind activity-based costing is simple and logical – costs and expenses do not arise automatically; charges and expenses are incurred as a result of management activities. There is no cost inside the organization; there are only activities carried out for customer service, which in turn lead to charges.

On the basis of the literature review, a diagram (Figure 1) can be drawn to illustrate the structure as well as the key concepts of the ABC system (Ellis-Newman, 2003; Karu, 2008).

Resources – an economic element that is required in the performance of activities.

Cost – the monetary value of resources used or sacrificed or liabilities incurred to achieve an objective, such as to acquire or produce goods or to perform an activity or service.

Cost driver – factors that cause changes in the cost of an activity.

Resource cost driver – an indicator that helps to associate the costs of resources to corresponding activities and to distribute the costs of different resources between activities.

Activity – what we do in an organization.

Activity cost driver – a measure of the consumption of an activity by products, customers or services. Used as a basis of assigning activities to cost objects.

Cost object – an activity, output, or item, of which cost is to be measured. In a broad sense, the cost object can be an organizational division, a function, task, product, service, or a customer.

There is a four-step approach to implementing the ABC system, involving the following steps (Ellis-Newman, 2003):

- 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.

The testing and implementation of the ABC method is already very common in university libraries around the world (Goddard & Ooi, 1998; Ceynowa, 2000; Poll, 2001; Ellis-

Newman, 2003; Heaney, 2004; Ching, Leung, Fidow, & Huang, 2008). Many library managers have decided that the activity-based costing method is the best of the existing cost analysis methods adapted for evaluating library products.

Some examples of studies in university libraries using the ABC model:

- The University of Southampton applied the ABC methodology to its library services in 1991. The results showed substantial differences in the allocation of the central overhead costs between academic faculties using the model and the existing system. The ABC approach resulted in significant improvements in several aspects. It: 1) created incentives so as not to over-consume library services, 2) provided more equitable overhead allocation than traditional systems, and 3) resulted in verified and refuted allocated costs (Goddard & Ooi, 1998).
- In 1996, Edith Cowan University (ECU) in Australia adopted the ABC and undertook practical steps towards implementing the system. The feasibility of the activity-based costing method in the context of various library operations in the university library was studied. The research mostly focused on activities related to reader services and interlibrary loan. The results enabled library management to gain information about activity costs that the traditional university accounting system did not provide. The study allowed library managers to determine necessary and unnecessary activities. Only those services that added value were retained, whereas services with no added value were discontinued, thus cutting costs for the university (Ellis-Newman & Robinson, 1998).
- The German Research Association carried out a project "Cost Management for Academic Libraries." The aim was to test activity-based costing and develop a method of cost management appropriate to the financial management framework of public sector provision for academic libraries. The project started in April 1997 and resulted in the publication of a handbook that included the necessary software in July 1999. Fifty-five library "products" were defined. The project results showed that in view of the fact that budgets have become ever tighter, activity cost accounting helps to preserve and ensure the financial scope of academic information provision (Ceynowa, 2000; Poll, 2001).
- Oxford University Library Services (OULS) started to deploy the ABC system in 2001 to identify work efficiencies and calculate the actual costs of materials and services. Like most academic libraries, the income for OULS comes from multiple sources, including government funding, donations, and project funding. By implementing the ABC system, OULS was more accountable to the university for effective budget management than departments that have not yet analyzed their activities in such a way (Heaney, 2004).
- Three academic libraries – the Library of the University of Utrecht in the Netherlands, the Library of the University of Luleå in Sweden, and the Library of the University of Bremen in Germany – used the ABC analysis in the development of a current and future cost/benefit financial model to support the library management's decision-making and the library budgeting process by eliminating uncertainty. They compared the costs of current and future digitised library services. Future costs were defined as the costs of the desired and expected library service with a horizon of five to six years ahead. It appeared that, for example, the Utrecht University Library expects personnel costs to decrease by 12 percent, because the

number of personnel will decrease by 20 percent and the average wage per employee will increase by 10 percent, as the personnel will need to be more highly qualified, whereas Luleå University Library expects a minor decrease in personnel costs by three percent and Bremen University Library estimates the number of personnel to increase by five percent, so that personnel costs should also increase by five percent (Kollöffel & Kaandorp, 2003).

- In 2008, the ABC method was used to analyze and enhance the activities of the Super e-Book Consortium in Taiwan and Hong Kong. The Consortium includes 42 members from 160 universities and colleges. All consortium members pay an annual membership fee of 50,000 USD to the e-book fund. Since the number of full-time employees (FTE) in the member libraries varied from 10 to 350, those member library employees involved in the activities of the consortium were interviewed to determine key activities so that the ABC method could be implemented in the consortium. Each interviewee's role in certain activities was determined alongside the time (in hours) that they spent on these activities. Thereafter, the salaries of employees and other costs related to each activity were distinguished and the total cost of each activity was calculated, as well as the cost of the cost driver (Ching, Leung, Fidow, & Huang, 2008).

The ABC appeared to possess two significant flaws. Firstly, setting up the ABC system can be very costly, especially if the current accounting system of the university does not

support the collection of the ABC information. Secondly, the system needs to be regularly updated, which further increases its costs.

Moreover, it also became clear from many case studies in university libraries that the implementation problems of the ABC render it less efficient than theory would suggest. There are significant costs associated with developing and maintaining such a system relative to traditional methods. The library system was time-consuming to produce, taking one person almost three months of effort. To maintain such a system would also be relatively expensive, as the cost driver rates would have to be periodically recalculated. Producing similar systems for all central overheads would be very expensive.

These limitations motivated Kaplan and Anderson to develop the time-driven activity-based costing (TDABC) method, a revised version of the ABC, to solve these problems without losing the benefits (2004; 2007). The TDABC model can be estimated and installed quickly as 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. Hence, the TDABC systems can be implemented more quickly (and thus more cheaply), as well as updated more easily than the traditional ABC (Pernot, Roodhooft, & Van den Abbeele, 2007).

In other words, it is necessary to determine the capacity cost rate and the use of capacity of the implemented activities carried out by each subunit. Both parameters are easily identifiable. The capacity cost rate is determined as in Figure 2 (Karu, 2008; Kaplan & Anderson, 2007).

$$\text{Capacity cost rate} = \frac{\text{cost of capacity}}{\text{practical capacity of the resources (employee or machine)}}$$

Figure 2
The capacity cost rate formula.

Practical capacity is often estimated as a percentage, for instance, 80% or 85% of theoretical capacity. That is, if an employee or machine can normally work 40 hours per week, practical capacity could be assumed to be 32 hours per week. This estimate allows for 20% of personnel time for breaks, arrival and departure, and communication and reading unrelated to actual work performance, and 20% of machine time for downtime due to maintenance, repair, and scheduling fluctuations (Karu, 2008; Kaplan & Anderson, 2007). 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 interlibrary loan request – order reception, request handling, and transmission of orders) (Kaplan & Anderson, 2004). Knowing the real (practical) capacity of the resources used and the time spent on activities, it is possible to determine the cost of each activity by multiplying the time spent on activities by the practical capacity of the resources (Karu, 2008).

In the context of the university library, the TDABC method has been tested twice in Belgium, at the Arenberg Library of the Catholic University of Leuven.

- The first study concentrated on interlibrary loan (ILL). The data was collected via direct observations and by conducting interviews with the head of the library and employees involved in interlibrary loan. Data on the costs was obtained from accounting and the rest of the data retrieved from archival documents and annual reports of the library. The observations and the
- interviews were conducted in 2006 and the financial data dates back to 2005. The authors note that direct observation was carried out by the ILL staff member responsible: the researchers explained to each individual what to observe (i.e. all different activities concerning ILL)

and what to measure (i.e. the time needed to perform the activities). The interviews were open, without a structured questionnaire. The ILL activities were identified by separating incoming and outgoing requests as well as the originals and copies. After this, the cost per minute was identified, and based on this, the costs related to the ILL activities were determined. The results indicated, for example, that the scanning of articles to be sent out to the recipients took around 3.4 to 7.4 minutes, due to outdated scanning equipment, which also reduced the quality of the result. Readers often preferred articles that were scanned and forwarded via e-mail as PDF files to copies of articles sent by regular mail. This gives an opportunity to preserve the article for future reuse for the library that performed the scanning. Thus, an investment in new scanning devices would certainly pay off (Pernot, et al, 2007).

- The second study concentrated on acquisitions. The researchers set up a time-driven activity-based costing system for the ILL service and for the activities of acquisitions. Data gathering consisted of the following three steps: 1) The authors had a general conversation with the head of the library and some employees to grasp the scope and complexity of the acquisition process. It was important to know whether or not the scope should be limited (e.g., only the purchase of domestic books) or expanded (e.g., including cataloguing) to match the complexity to their expectations regarding the work and the time available. 2) The most important aspect of this step was that the researchers explicitly informed the staff about exceptions and alternatives. Since the researchers had only limited time and a limited sample for the measurements, they had to make sure that the sample was

representative for the general activity of the library. The staff walked them through different situations and possibilities, so that the authors of the study were able to measure each possibility, or at the very least mention that it is in theory a possibility, which is very rarely used. 3) The authors timed the staff during the performance of those tasks. They made measurements at specific times over a two month period, and noted some representative cases, in addition to the regular workload on that day. The authors also “replicated some information of a certain measurement.” For instance, they timed each e-mail that was opened, using the same time for the action “opening and reading mail” in different sections and phases. The measurement was continuously done for several cases, while the researchers kept track of the time of each phase. Not stopping after each case and starting again at the next assured a more normal environment for the employees (Stouthuysen, Swiggers, Reheul, & Roodhooft, 2010).

The authors of both studies conclude that the TDABC can contribute to the provision of better library services at lower costs. Moreover, according to the authors, the TDABC approach looks promising for other library services, such as “cataloguing” or “reference services,” which have similar characteristics to ILL and acquisitions (complex, time consuming and entailing a good deal of variation) (Pernot et al, 2007; Stouthuysen et al, 2010).

Discussion

By weighing the advantages and disadvantages of TDABC and ABC methods, it can be concluded that the TDABC method is better suited to university libraries. Since the university libraries usually belong to the central accounting system of the university, the exploitation of the ABC model would be

more time-consuming, laborious, and costly, and also assumes investment by university management. The following ideas are presented as potential areas where the TDABC model could be applied in a university library.

1. Many leading university libraries (especially in the Baltic and Nordic countries) are the subjects of the legal deposit copy act, which, on one hand, provides university libraries with means to enhance their collections; yet, in library work, it is not acceptable to consider deposit copies as sources of acquisition free of charge. On the other hand, the acquisition of deposit copies does not allow the library to suspend further acquisition, due to the strict rules imposed on the usage of deposit copies stemming from the obligation of permanent preservation – deposit copies are not subject to home lending and can be used only in the reading rooms of libraries. Thus, the registering, processing, additional acquisition, and preservation of deposit copies result in large costs to libraries.

2. The growing number of new publications (books and periodicals) that need to be registered and placed on reading room shelves leads to the need for an increased number of personnel and time spent, which enhances the costs of these activities. A comparison between the in-library use, home lending, and interlibrary loan suggests that the in-library use of publications by experienced readers is the cheapest of the three, as it saves the time of the library personnel. In the case of home lending, additional time is used for documenting the loan, returning the publication, or extending the loan. However, most research libraries have acquired self-service machines for returning and borrowing publications, which enables them to reduce the workload of librarians and cut queues in rush hours. The self-service returning machine enables patrons to return books 24 hours per day, including Sundays and public holidays, when the library is closed.

3. Interlibrary loan is a widely used service by libraries, which enables librarians to order publications missing in one library from other

libraries, thereby providing users access to the resources of other libraries. An exact cost accounting is especially important with interlibrary loan, since the operating costs of this service and the qualification requirements of the personnel are higher than those of regular loans. In addition, interlibrary loan is a service requiring considerable amounts of time. Costs of interlibrary loan enquiries differ substantially – there is a large difference between simple and more complex enquiries. The processing of an interlibrary loan enquiry might take from five minutes up to one hour, depending on how difficult it is to find the desired publication in a domestic or foreign database. Thus, placing all interlibrary loan activities under the same total expenditure, without considering different types of interlibrary loan enquiries, would be inaccurate.

4. The number of enquiries submitted during periods of academic work is considerably higher compared to, for instance, the summer period, when no substantial academic work is being carried out. In order to respond to an increased need during busy periods, more staff from other departments are relocated to work at the information desk, which increases the costs in the cost pool of personnel costs. If additional workforce was not used and resources were not decreased, the quality of service would drop at busy periods. If staff was not relocated to perform other tasks during periods of low academic work, when the number of enquiries is small, the costs of processing enquiries would become unacceptably large.

5. The TDABC model provides considerable potential for exploitation in electronic libraries. Once the processing of printed publications has achieved almost maximum efficiency, then attention can be focused on digital materials. For instance, negotiations regarding the purchase of licences for electronic materials can be much more time-consuming than those for printed publications or journals. The use of some electronic materials requires specific equipment and computer workstations. The acquisition of

such an infrastructure and its maintenance is obligatory for the library, and these expenses must also be considered. Furthermore, the services related to electronic materials, in turn, require more highly skilled and higher paid personnel.

Although not trained as accountants, library managers rely on accounting information for strategic planning and operational decision-making. Increased demands for institutional accountability with university performance and costs under increased scrutiny place library managers under increased pressure to maintain quality services while faced with decreased funding and tighter budgets. A commitment to greater efficiency requires an understanding of cost behaviour.

Conclusions

The ABC and TDABC models are both suitable for university libraries, particularly when managers are seeking the answers to specific questions, such as the costs

- to acquire (order and purchase) a book,
- to catalogue a book,
- to provide an interlibrary loan service,
- to provide reference services,
- to acquire an electronic database,
- and other processes.

The implementation of cost accounting systems in libraries has historically been treated as a technical innovation rather than an organizational or management innovation. This means that the results of such research are largely affected by:

- what methods are used to identify the time spent on activities and
- how well the management of libraries or researchers were able to explain to the staff the necessity for such research.

The most important consideration is that librarians are not machines that can be set at a given speed and expected to produce a uniform product.

For better management of public sector organizations, it is vital to cut costs and

achieve efficiency and proficiency in both the short- and long-term. The potential to activate better management practices certainly exists in almost every public sector organization, including libraries.

As is evident from the studies described, the testing and implementation of the ABC model is already widespread across university libraries. Many library managers have decided that the activity-based costing method is the best of the existing cost analysis methods adapted for evaluating library products. However, the fact is that many managers who have tried to implement the ABC in their organizations have abandoned the attempt in the face of rising costs and employees' irritation. And last, but not least, this system can only be implemented in collaboration with the accounting department of the wider organization.

In contrast, the TDABC model can be tested and implemented by departmental managers for each separate library department. The TDABC considers many aspects that affect employees' efficiency and performance, e.g., rest periods, personal time for breaks, arrival and departure, and communication and reading unrelated to actual work performance. However, the involvement of experts in costing and economics is recommended.

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