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ACTIVITY-BASED COSTING IN UNIVERSITY LIBRARY SERVICES

Summary: Nowadays the problem of efficient costs management affects not only the manufacturing industry concentrated on profits. Many factors, above all managers' awareness, cause universities to try to find solutions which ensure information support in the cost area. The article presents the model of activity-based costing that could be implemented in one of the functional areas of universities – in libraries. The authors think that the model would allow a better understanding of library operating costs, optimize them, improving quality of services and, consequently, increase student satisfaction.

Keywords: activity-based costing, library, university, cost calculation.

1. Introduction

Considerations on the use of activity-based costing (ABC) in universities can be found in many publications from the turn of the 20th and 21st century. Several universities in the United States [Cox, Downey, Smith 1999], Australia [Ellis-Newman, Robinson 1998] or Europe [Crooper, Cook 2000] has already attempted to implement ABC. The topic is still valid as there are new sources of literature [Ratnatunga, Waldmann 2010] about the application of ABC into the costs systems of universities. This method is also taken into account by the EUA (European University Association) as the destination account for the cost of higher education in Europe. In Polish literature there are also publications about using ABC at universities [Klaus-Rosińska et al. 2007; Klaus-Rosińska, Ryńca 2008; Kuchta, Klaus-Rosińska, Ryńca 2009; Leja 2002; Miłosz 2003; Ossowski 2009ab; Szuwarzyński 2001]. Interest in the subject in Poland is becoming greater and greater every year.

The aim of the article is to present trials that have been taken at Wrocław University of Technology (Poland) connected with the use of ABC in the departmental libraries. The study was undertaken because the universities in Poland, in contrast to many foreign universities, do not yet apply a sufficient degree of methods and concepts developed by the managerial accounting. The proposed model is based on authors' own experiences related to the research on functioning of universities, con-

ducted interviews with library staff, examining documents and carried out literature review.

2. Activity-based costing at universities

Activity-based costing (ABC) was created at the end of 1980s as the reply to imperfections of the traditional costing [Cooper, Kaplan 1998]. The traditional costing system allocates costs of resources in one step process (directly to products, services or customers) using several simplistic cost drivers, often produces inaccurate and misleading information. ABC focus on the activities performed to product or service cost objects. The ABC calculation assigns cost of resources to cost objects in two stages. In the first stage one determines costs of activities/processes of an organization; in the second stage, costs of activities/processes are ascribed to cost objects.

Analyzing the information currently available regarding the use of ABC in the educational environment, one can replace some basic information related to the conceptual solution of this method:

1. From the viewpoint of the first element of ABC – resources, at university we can extract the resources at two levels of functioning: the level of university and departmental level [Granof, Platt, Vaysman 2000; Klaus-Rosińska 2009]. Table 1 shows examples of the resources marked for the level of department.

Table 1. List of resources at the level of department

| Resources – departmental level | Fundamental processes involving resources |
|--|---|
| 1. Faculty staff | (1) Teaching process (2) Research process (3) Professional services process |
| 2. Organizational units of the department: 2.2 Dean's office 2.3 Library 2.4 Administration of the department 2.5 Scientific journal editors 2.6 (...) | (1) (1), (2) (1), (2),(3) (2) |
| 3. Space of the department: 3.1 Didactic and research area: – classrooms – specialist workshops – laboratories 3.2 Circulation area and other spaces of general use | (1) (1), (2),(3) (1), (2),(3) |
| 4. Material and laboratory reagents | (1), (2),(3) |
| 5. Specialized equipment and software | (1), (2),(3) |
| 6. (...) | |

Source: authors' own work.

Each identified resource will be associated with a specific cost pool. For example, cost pools of resources like a faculty member (see Table 1, Position 1) will consist of costs such as salaries and other employee benefits, functional additives and any other costs that are attributable to the employee, such as allowances for travel, the cost of space assigned to him or her, the cost of IT services rendered in his or her favor; one can also include the costs of the functioning of the organizational units of a department (e.g., libraries).¹

Resources identified at the general level of university should be related to its organizational units. The units may include main library, central administration, the rector, the language center, office level careers, publishing companies, etc. (number of identified target resources at this level will depend on the specifics of a university).

2. Considering the second essential element in ABC – the activities – we can talk about grouping them into three basic processes performed at a university: the teaching process, research process, professional services process [Cox, Downey, Smith 1999; DETYA 2000; Granof, Platt, Vaysman 2000]. Universities during the realization of these processes consume/use their resources. This does not mean that all resources will be equally used in individual processes. It is worth noting that there can appear situations where resources are consumed for one process (e.g., a resource like a dean's office will be used only during the realization of teaching, the resource like scientific journal editors relates only to the process of research), then the costs associated with the use of such resources will be assigned only to the substantial process. There will also be those resources that do not directly serve any of the fundamental processes (such as circulation area). Table 1 presents an indication which resources are consumed/used at university by its basic processes.

3. The last element of activity-based costing – cost objects – should be considered in terms of three processes carried out by a university. This means that for each process and activities identified inside of them there will be separately specified cost objects. Thus, for the teaching process the cost objects can be: a student, the unused capacity of teaching [Granof, Platt, Vaysman 2000; Klaus, Kowalski 2007], faculty of study, year of study, etc. In the process of research, we can talk about the cost objects such as publication, patent, prototype, etc. In the case of the professional services, the cost objects can be: expertise or other specialized service. The examples of cost objects for a university are included in Figure 1.

¹ Making settlements between resources in ABC was described in detail in Klaus-Rosińska [2009]. The author suggests a separation of resources into two types: “target resources” and “support resources”. Support resource is a resource whose costs are settled on the other resources. While target resource is a resource located at the lowest level of the hierarchy of resources. Its costs are settled by actions on the cost objects.

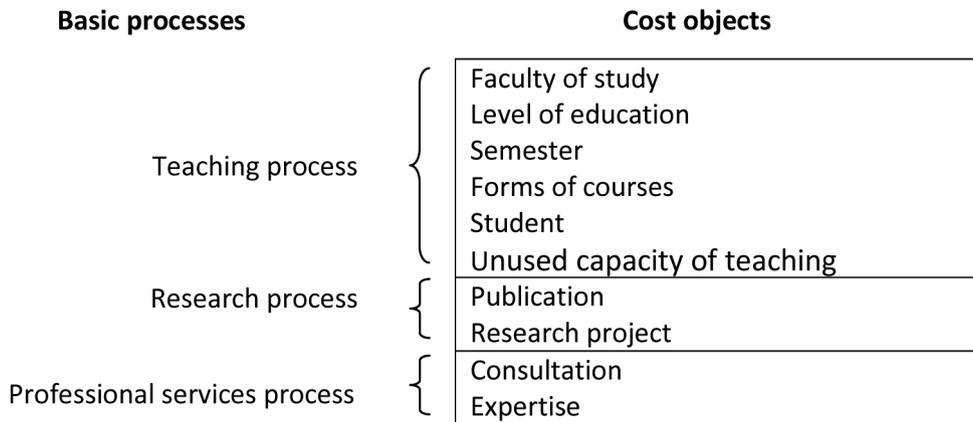


Fig. 1. Examples of cost objects for universities

Source: authors' own work.

According to the idea of ABC, each resource (taking into account the proposal of Klaus-Rosińska, each target resource) should be settled through activities on objects cost. For the purposes of this article, the authors took into account the target resource in the department, which is the library. This resource is used in the process of teaching and research process. It could be said that the costs of specified cost objects will be related to the teaching and research costs. The authors of this article will present two case studies of using ABC in departmental libraries in selected departments of Wrocław University of Technology (Poland).

3. Activity-based costing in university libraries

There are several publications that focus on describing the applicability of activity-based costing in selected organizational units supporting university teaching and research, such as a library [Ellis-Newman, Robinson 1998; DETYA 2001; Gerdson 2002; Heaney 2003].

The authors using the information contained in the above literature positions and based on their own experiences [Klaus, Kowalski 2007; Klaus, Ryńca, Kowalski 2007] propose to introduce activity-based costing in the functioning of the departmental libraries, which is described in Sections 3.1 and 3.2.

3.1. Case Study No. 1 – teaching and research departmental library

One of the areas for which a model of ABC was made is the teaching and research departmental library of Wrocław University of Technology (Poland). One of the first steps that was taken, similarly as in the case of ABC model for the dean's office

[Klaus, Ryńca, Kowalski 2007], was to download the cost information of the library from the financial-accounting system, later the costs information created the cost pools of the resources of library. Five resources of library were identified, which were employees of the library. Each cost pool of the resources contained costs: related to salaries of employees, the derivatives of those workers, the costs of maintaining the surface, the costs connected with equipment (e.g., depreciation of devices) and other costs (e.g., IT services). Additional sixth resource of the library was the “open-space of the library”, cost pool of the resource contained the cost of maintaining the surface including: cleaning, depreciation (repair fund), surveillance services, media consumption, energy.

An important task was also to identify processes and activities in the library. This is a key step in the process of developing the ABC model. This identification was based on interviews with employees of the library. The purpose of interviews was to learn the tasks performed on individual jobs and the products of those activities. During the interviews employees were also asked to indicate the percentage of time that each employee spends on the implementation of individual activities. Therefore, the resource driver in ABC was the time declared by employees, dedicated to perform their activities.

During the interviews we recognized the need to clarify the reasons for the talks. This task was necessary because of the large reserve of workers approached to discuss the issues, especially those associated with the time necessary to perform the activities. It was feared that the talks have a control character. It was therefore important to present the substance of ABC and an indication of the benefits of its use in the departmental library.

During the interviews we tried to gather as much information related to the functioning of the library as possible in order to understand the operations that it performs and the dependencies between them. The result of an interview conducted with each employee was a “final report” that contained the identified activities, their products and time spent on activities. Developed reports of the interviews were an important information base for “dictionary of activities”, which included the identified activities in this area and suggested improvement actions and performance measures. Table 2 shows a sample of report compiled in the interview conducted with the head of the library.

As shown in Table 2, the result of the interview with the head of the library, identified five main activities. The Table 2 also sets out activity products that have become cost objects.

As a result of the carried out work, we observed that in the teaching and research library the following activities are realized (including the use of all five human resources):

1. current library service,
2. loan services among libraries,
3. collection of literature,

Table 2. Sample of the report compiled in the interview conducted with the head of the library

| Employee: X Position: Head of the library | | | |
|--|--|-----------------------|--|
| Process/activity | | Driver | Activity product/ activity cost receiver |
| 1 | Current library service (current lending and sharing collections, including the implementation of information and scientific functions, searching literature sources, selection of the collection) | % declared time | Readers from outside the Department: x% Readers of the Department: x%, including: – x% of employees of the Department – X% of students of the Department ² |
| 2 | Collection of literature (ordering, cataloging and other work related to newly acquired volumes) | % declared time | Maintenance and development of the library |
| 3 | Prepare lists of literature (search collections of other libraries, books on Polish and foreign markets) | % declared time | Employees of the Department |
| 4 | Support for collections of literature (transmission library books for binding, selecting books to “retro-conversion” – give main library signatures) | % declared time | Maintenance and development of the library |
| 5 | Coordinating the work of other employees of the library (assigning tasks, supervising the work) | % declared time | Maintenance and development of the library |

Source: authors' own study.

4. documentation of faculty staff works,
5. preparing lists of literature,
6. support for collections of literature,
7. monitoring the timely donation of books,
8. coordinating the work of other employees of the library.

The above actions are performed by various library staff who spend varied time effort to achieve them. The most time-consuming activities turned out to be: the current library services, the collection of literature and the documentation of faculty staff works. Because the resource driver was declared time of work, the more time-consuming activity, the more costly activity. Hence, in the presented library the most expensive action is associated with the current library service, which represents more than 50% of the cost structure of the library. It is also the activity for which

² Assuming that the recipients of the activity are all students of the Department, they may equally use the library service.

employees spend up to several hours a day. Next actions are: collection of literature – 16%, and documentation of academic achievement – 13%. Other activities are a small share in the cost structure of the library.

The next step in developing the ABC model in the library was the allocation of the cost of activities to cost objects. It was assumed that the recipients of most of the activities carried out in the library were: a student, a graduate student and employee. Figure 2 shows the structure of the determined cost objects.

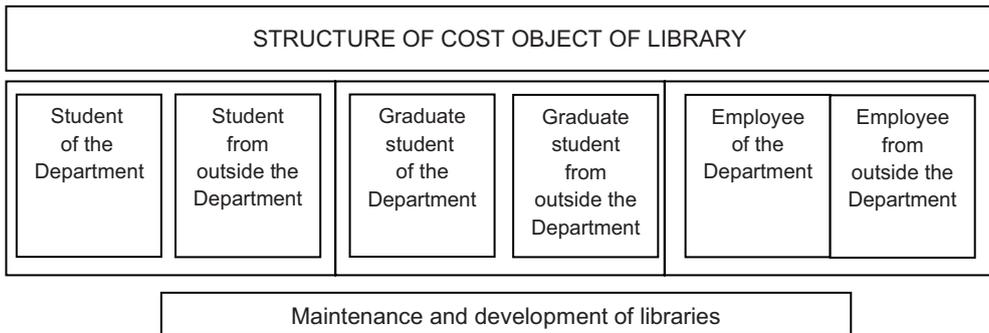


Fig. 2. The structure of the determined cost objects of the library

Source: authors' own work.

Basing on the analysis, we found that the recipients of the library activities are students of the Department and students from outside the Department. The same is in the case of doctoral students and employees. What was also indicated was an artificial cost object “maintenance and development of the library”. This object had accumulated costs of activities that were not allocated to the other determined cost objects.

It is worth highlighting that the sixth resource “open-space of the library” was settled on the cost objects only through the activity “current library service”.

Determining the cost of separate cost objects allowed obtaining answers to the following questions: How much is the departmental student/PhD student from the viewpoint of library services? How much is the departmental employee from the viewpoint of library services? How much are other readers?

3.2. Case Study No. 2 – separate departmental libraries: scientific library and teaching library

Another model of ABC was the model developed for the two separately functioning libraries of the next of Wrocław University of Technology department. One library was connected with lending books and supporting the reading room (it was called “the teaching library”), the second library had a scientific nature (it was called “the scientific library”).

A way to develop a costing model was similar as in the case of the library described in Section 3.1. Namely, it considered the following steps:

1. analyzing the costs associated with the libraries and creating cost pools of identified resources,
2. identifying activities of both libraries,
3. establishing costs of the activities,
4. identifying in the model cost objects,
5. establishing costs of the various cost objects.

The settlement of costs for case study no. 2 is illustrated in Figure 3.

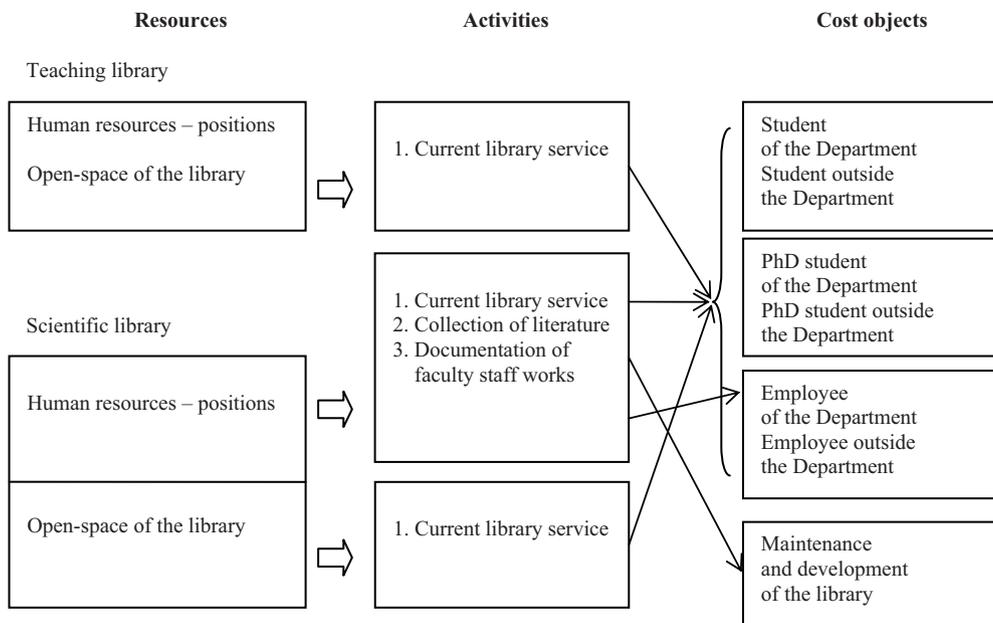


Fig. 3. Settlement of costs for a case study no. 2

Source: authors' own work.

In the case of the model, we can speak of two main areas of costs that will be allocated through actions on objects cost. One area is “the teaching library”, the second is “the scientific library”.

Within the area of “the teaching library”, we identified four human resources (positions). Cost pools of these resources included (similarly, as was in case study no. 1) all costs, which could be attributed to individual employees, including: salaries, costs associated with the maintenance of areas used by employees, depreciation of equipment assigned to them, the cost of consumables, costs of ICT, etc. Cost pools of resources were allocated to cost objects by one activity (identified during the interview: “current library service”). The cost objects were: students (departmental

and non-departmental), graduate students (departmental and non-departmental) and faculty staff (departmental and non-departmental). The fifth library resource was “open-space of the library”, the cost pool of this resource contained all the costs associated with maintaining the surface (cleaning, media, energy costs, etc.). The fifth resource, like the other four (human), was settled by one action (“current library service”) at the specified cost objects.

Within the area of “scientific library” we identified three human resources and the fourth resource: “open-space of the library”. Cost pools of human resources were allocated by three selected during the interviews activities of the library: “current library service”, “collection of literature”, “documentation of faculty staff works”. Resource driver was the present declared by the library staff time. The structure of cost objects was developed analogically to the structure of cost objects from case study no. 1 (see Figure 2). It is noteworthy that some of the activity costs in 100% were assigned to the selected cost objects: the cost of activity “documentation of faculty staff works” was assigned to cost object “employee of the Department”, the cost of activity “collection of literature” was assigned to artificial cost object “maintenance and development of the library”.

3.3. Evaluation of proposed solutions and expected results of the implementation

The authors believe that the implementation of the proposed model would bring to universities several benefits. Managers of universities achieving accurate information of costs about the operation area, which is the library, could make more appropriate management decisions. It would be possible to estimate the costs of the processes in the library and the costs of the various cost objects (students from various departments, universities, labor, etc.).

This information seems to be very valuable from the management point of view; it would not only demonstrate differences in the costs of services, but also by information about cost factors it would be possible to take an appropriate action to improve functioning. The implementation of the proposed model could also support the process of budgeting.

Obviously, the proposed solutions are not perfect. First of all, it should be emphasized that the use of resource cost driver, which is the declared time, has an effect that to the costs objects one assigns not only the cost of used resources, but also the costs of unused capacity. Thus, to cost objects historic costs are assigned. Nevertheless, in the literature declared operating time is the most often suggested resource cost driver [Granof, Platt, Vaysman 2000; Ossowski 2009ab].

4. Conclusions

This article presents the theoretical basis of activity-based costing and presents the possibility of using ABC in the departmental libraries of one of Polish universities.

The benefits of using ABC seem obvious: to obtain reliable cost information, yet inaccessible. It is difficult to manage an organization well, not really knowing the amount of costs. Activity-based costing makes such knowledge achievable. Obviously, its use is not easy as it requires both the university supervisors support and positive attitude of employees. Nevertheless, it seems that in the end it is worth bearing the costs and “lossing” time to implement, because it will allow authorities both of the university and its individual units, as well as individual workers, to better understand and control costs for which they are responsible.

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RACHUNEK KOSZTÓW DZIAŁAŃ W USŁUGACH BIBLIOTEK SZKÓŁ WYŻSZYCH

Streszczenie: Tematyka sprawnego zarządzania kosztami nie dotyczy jedynie przedsiębiorstw produkcyjnych nastawionych na zysk. Wiele czynników, a przede wszystkim świadomość osób zarządzających, powoduje, że również szkoły wyższe poszukują rozwiązań umożliwiających wsparcie informacyjne w wymienionym obszarze. W artykule przedstawiono model rachunku kosztów działań, który mógłby zostać zaimplementowany w jednym z obszarów funkcjonalnych szkół wyższych – w bibliotekach uniwersyteckich. Zdaniem autorów zaimplementowany model pozwoliłby lepiej zrozumieć koszty funkcjonowania biblioteki, ich optymalizację, poprawę jakości usług, a w konsekwencji zwiększenie zadowolenia studentów.

Słowa kluczowe: rachunek kosztów działań, biblioteka, szkoła wyższa, kalkulacja kosztów.