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Time-driven activity-based costing for a library acquisition process: A case study in a Belgian University

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ABSTRACT

Library managers are continuously urged to provide better library services at a lower cost. To cope with these cost pressures, library management needs to improve its understanding of the relevant cost drivers. Through a case study, we show how to perform time-driven activity-based costing for a library acquisition process in a Belgian university and provide evidence of the benefits of such an analysis.

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1. Introduction

One of the main challenges facing academic libraries is that of providing quality library services at continuously diminishing costs. As many library services are free of charge, academic libraries rely heavily on government funding. However, government funding does not cover increasing library costs (Ellis-Newman & Robinson, 1998). To keep costs under control it is important for library management to gain insight into the relevant cost drivers. Recently, libraries have started to invest in more sophisticated cost-accounting systems, such as activity-based costing (ABC) (see, for example, Ellis-Newman & Robinson, 1998; Ellis-Newman, 2003; Goddard & Ooi, 1998; Ching, Leung, Fidow, & Huang, 2008). ABC is an advanced cost calculation technique that allocates resource costs to products based on resource consumption. Since ABC may provide greater visibility concerning organizational processes and their cost drivers, researchers have claimed that ABC allows library managers to better control costs, for example by eliminating costs related to non-value adding activities (Ellis-Newman & Robinson, 1998; Ellis-Newman, 2003).

While several articles have advocated the use of ABC by service organizations in general and academic libraries in particular (Ellis-Newman & Robinson, 1998; Ellis-Newman, 2003; Goddard & Ooi, 1998; Ching et al., 2008), there is, nevertheless, a need for some degree of caution. Kaplan and Anderson (2004, 2007), for example, note that the procedure for estimating an ABC model has proved to be difficult and costly, especially if the current accounting system does not support the collection of ABC information. It has also been argued that updating the ABC model through a new round of interviews and surveys further increases its time and resource consumption (Kaplan & Anderson, 2007). As a result, Pernot, Roodhooft, & Van den Abbeele (2007) claim that many managers who have tried to implement ABC in their organizations, including library managers, have abandoned the attempt in the face of rising costs and employee irritation.

In order to overcome the difficulties of ABC, Kaplan and Anderson (2004, 2007) developed a new approach to ABC, called time-driven ABC (TDABC). Accordingly, a TDABC model is simpler and faster to implement as it requires estimates of only two parameters: (1) the unit cost of supplying capacity and (2) the time required to perform a transaction or an activity. The breakthrough of TDABC lies in the usage of time equations to estimate the time spent on each activity (Demeere, Stouthuysen, & Roodhooft, 2009). Through the inclusion of multiple time drivers, a time-driven approach to ABC can capture the complexities of organizational processes far more simply than the traditional ABC system. After all, the latter would have to account for varying

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transaction times by treating each variant in the process as a distinct activity, which significantly increases its complexity (Cooper & Kaplan, 1988; Kaplan & Anderson, 2007; Everaert, Bruggeman & De Creus, 2008). As a result, TDABC seems to offer a way to design useful cost models for academic libraries, where processes are often multi-layered and diverse.

This paper describes the development and application of a TDABC system for a small to medium sized academic library in a Belgian University. While TDABC may improve the cost management of several library processes, in this study we only focus on the acquisition process. More specifically, the acquisition process we studied, concerns print formats (books, journals and grey literature) and covers key traditional acquisition concepts (ordering, receiving, paying, and using integrated library systems and online vendor databases in an acquisition's workflow).

Though digital libraries began more and more to be developed, we believe that it is still useful to analyze an acquisition process of print formats. Indeed, Dorner (2004) provides empirical evidence that print formats are still important and continue to pour into acquisition activities. In his study on the roles of collection managers in research libraries, he observed that not only the levels of responsibility and time spent on activities related to digital resources but also to nondigital resources have increased compared to 5 years ago. One reason for this is that print and digital formats each have exclusive values, and until those values can be replicated in other media, both formats must be collected, maintained, and supported by libraries. Some authors even argue that print formats have independent value and contain centuries of information not yet available in digital formats (see, for example, Thornton, 2000; Wu, 2005). According to Wu (2005), the wonders of technology arrive with countervailing questions about preservation, long-term research needs, content quality, document control and authenticity. Technology's nature makes it vulnerable to attack, modification, and disappearance, and its evolution has not yet reached a point where it rivals print in stability, longevity, and ease and comfort of use.

A final argument why the acquisition of print materials offers an attractive context for this study, is that previous studies have demonstrated that the collection of print materials often goes together with high staff related costs and many cost saving opportunities (Schmidt, 1999; King, Aerni, Brody, Herbison, & Knapp, 2004). As TDABC explicitly incorporates resource capacity and highlights unused resource capacity, we therefore believe the TDABC technique is particularly suitable to eliminate costs related to non-value added activities in print acquisition environments and improve process efficiencies.

The remainder of this paper is organized as follows. In the [Theoretical background: from ABC to TDABC](#) section we briefly address the technique of TDABC. In the [TDABC in an academic library](#) section we present the TDABC academic library case. In the [benefits of TDABC: some managerial implications](#) section we describe how the TDABC information guided library management in streamlining the acquisition process. We end with concluding remarks in the [Conclusion](#) section.

2. Theoretical background: from ABC to TDABC

ABC has proven to be a valuable tool in service organizations such as academic libraries (Ellis-Newman & Robinson, 1998; Ellis-Newman, 2003; Goddard & Ooi, 1998; Ching et al., 2008). It helps understanding cost drivers and identifying non-value adding activities and services or processes consuming more resources than average. The core idea behind ABC is that cost objects (e.g. products and customers) consume activities which in turn consume resources (e.g. wages and equipment) (Demeere et al., 2009). The assignment of overhead costs occurs in 2 corresponding stages. In the first stage, resources are allocated to activities using *resource cost drivers*. For example, wages are allocated to the activity "ordering" using "the amount of books received" as a resource cost driver. In the second stage, the cost of activities is allocated to the cost objects using *activity cost drivers*, which measure the demands a cost object places on an activity. The process of an ABC model typically follows the steps outlined in [Table 1](#), Panel A.

While traditional cost-accounting systems allocate overhead costs using a single volume-based ratio, the ABC model achieves improved accuracy in the estimation of costs by using multiple cost drivers (Everaert, Bruggeman, Sarens, Anderson, & Levant, 2008). Additionally, the produced ABC information assists library management in their monitoring and decision-making activities and makes it more likely that managerial recommendations will be able to concern amelioration opportunities (Pernot et al., 2007; Ching et al., 2008).

Table 1

Activity-based costing versus time-driven activity-based costing.

(Source: Everaert et al., 2008b).

<i>Panel A: ABC</i>	
Step 1	Identify the different overhead activities
Step 2	Assign the overhead costs to the different activities using a resource driver
Step 3	Identify the activity driver for each activity
Step 4	Determine the activity driver rate by dividing the total activity costs by the practical volume of the activity driver
Step 5	Multiply the activity driver rate by the activity driver consumption to trace costs to orders, products or customers
<i>Panel B: TDABC</i>	
Step 1	Identify the various resource groups (departments)
Step 2	Estimate the total cost of each resource group
Step 3	Estimate the practical capacity of each resource group (e.g. available working hours, excluding vacation, meeting and training hours)
Step 4	Calculate the unit cost of each resource group by dividing the total cost of the resource group by the practical capacity
Step 5	Determine the time estimation for each event, based upon the time equation for the activity and the characteristics of the event
Step 6	Multiply the unit cost of each resource group by the time estimate for the event

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