

Costs calculated by the ABC system for underlying managerial decisions

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Abstract: *This article aims to show the importance of cost information and economic effects in making management decisions. Management accounting contributes to planning, budgeting and controlling costs. All economic entities are concerned with the cost elements generated by the accomplishment of their activities. Specifically, to analyze whether the data and information obtained in the ABC provides a more relevant information support, able to lead to a substantial improvement in decision-making. The ABC system, whose approach is still the subject of numerous queries and discussions, gives answer to some concerns regarding the current management control, both in terms of cost management and performance. The accurate relevance of full cost obtained by following the causal links between the products and the consumption of resources is an important advantage in terms of using this cost in making decisions regarding strategic management product portfolio.*

Keywords: *managing accounting, costs, managerial decisions, costs calculation, financial analysis*

JEL Classification: M40, M41

Introduction

The ABC system is the result of many theoretical and applied publications, as there is no single approach but various improvements made to first experiences.

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The early concept dates back to the '60s in the US. The experience from General Electric and theoretical academic work marks the first steps of the method by researching information allowing a better grasp of the indirect costs (overheads). Peter Drucker warned in 1963 about the lack of relevance of traditional models for calculating production costs in making decisions. These models, having as main variable the volume of production, are leading to mutual subsidies between product costs, creating distortions and affecting the validity of the results.

During the 1970s and early 1980s, Robin Cooper and other American researchers (Kaplan, Porter, Miller) and French (Mevellec, Lebas, Lorino) developed the ABC system in the current version. In this regard, the international group of enterprises and consulting firms CAM-I (Computer Aided Manufacturing - International) plays an important role with its program CMS (Cost Management Systems) which develops and funds numerous research in the field.

The concept of the method is based on the fact that activities not the products consume resources, and various activities of the company are used for products. Therefore the 'cutting' of company by activities and not by functions and products is preferable.

Research Methodology

To answer the previous question, we initiated approaches regarding the practical reality of the ABC system.

Facilities are replaced by the cost inductors that are not necessarily quantitative criteria, but elements that trigger activities and thus generates costs.

This approach needs a systemic vision of the company and a global approach to productivity, closer to reality. It supports the concept - Porter's value chain - whose subdivision type (P.Mevellec, 1990) is shown in the following figure:

Supporting activities	Company's Infrastructure					MARGIN
	Human Resources' Management					
	Technology development					
	Supplies					
Principal activities	Logistics internal	activity basic (productive)	logistics foreign	marketing and sale	Services and leadership	

Subdivision of chain value

Source: M. Porter, *L'avantage compétitif*, Interéditions, Paris, 1986

As part of the modern strategic analysis, this concept corresponds to the current needs of cost information which claims, more and more, the determination of costs of different elements of the value chain. It highlights the need to identify activities that contribute to product development. Some of activities are perceived by the customer as "giving" value to the product, namely bringing features or services for which the customer is ready to pay the price. These activities contribute to the maintaining or increasing of market shares - and margins – of an enterprise, representing decisive and sustainable competitive advantages in relation to other firms in the same sector.

Improving the performance of an enterprise depends on its ability to produce value for its customers, minimum resources being consumed for this purpose.

Methods of tracking consumption and production costing are applied for managerial decisions at different levels of management and are treated differently in the literature.

M. Caraiani., M. Dumitrana identify two basic methods for calculating the cost - commands method of terminal cost and processes method or cost for period, comprising: phase method, global method and the services method. (M. Caraiani, M. Dumitrana, 2008).

O. Calin, M. Man and M. Nedelcu, highlight the distinct methods of tracking consumption, attributing certain essential criteria to cost calculation, namely: the global method, by orders, phases, of standard cost, direct-costing or variable costs. (O. Calin, M. Man, and M. Nedelcu, 2008).

The two concepts - COST - and - VALUE - must therefore be put together thus constituting the "axis of" priority of the restructuring management in the future.

The "cut" of the undertaking into activities and analysis of these activities from the angle of resource consumption and value creating offers new possibilities for value analysis. The character of "unproductive" assigned to an activity that does not have a direct relationship with the end product is still present in assessing the activities of an undertaking. For this reason, also the accounting still ignores the so-called "supportive" activities, which finally are essential to the effectiveness of core activities and even value creating, so being vectors for company's performance.

Current methods of costing regroup in terms of resource consumption all these activities which are not directly related to operating activities, in a separate heading of "general expenses". It requires "ventilation" of this box in basic activities and determination, for each part, of a unit of consumption of resources.

This unit, called inductor cost (cost driver) - measures the performances provided by that activity to products.

In the Romanian language explanatory dictionary, the term calculation is defined as "a set of calculations according to certain rules to determine appropriate indicators (cost of a product, a work)". (Sorin Căpșuneanu, 2002).

The basic principle of the ABC method is a more realistic assignment of indirect costs than traditional methods, eliminating possible conventionalism from the allocation of those costs. The following figure highlights the differences.

TRADITIONAL APPROACH		
RESOURCES	→ Direct costs -----→	PRODUCTS
RESOURCES	→ Indirect costs → Analysis Centers →	PRODUCTS
BY ADDRESSING ABC SYSTEM		
RESOURCES	→ COSTS → ACTIVITIES →	PRODUCTS

Steps in assigning costs on products

Source: Sorin Căpșuneanu, 2002

The ABC system includes a more pertinent assignment of the costs highlighting the relationships between resources, activities and products.

The basic postulate of this method is as follows:

- The products consume activities and activities consume resources.

The notion of activity is the foundation of method, which thus demonstrates the causal link between consumed resources and the produced ones, for every individual stage of their collaboration, through activities involved in their realization.

1. Implementation of the ABC system

The construction of the cost calculation model, by the ABC method, involves the following steps:

- Identify the activities;
- Evaluation of resources consumed by each activity;
- Determination of cost drivers and calculation of unit costs and inductors;
- Assignment of activities' costs by costing items (products).

a) Identify the activities

Activity is defined as a set of elementary homogenous tasks, characteristic to a value chain achieving process and a resource consumer.

Activities "describe" what the various sectors of the organization do, and this, in turn, appears as a set of activities that are linked between inside the identified processes. The "mapping" of undertaking by activities exceeds the strict border of functional and hierarchical "cut", expressing a cross view over the enterprise; so that only this perspective enables the understanding of value creation, especially for supportive and introducing activities for a continuous improvement of processes, compatible with the total quality approach.

"Census" activities are crucial to the method's success, a sufficiently detailed mapping of activities has to be studied, without neglecting cost of obtaining the information necessary for this purpose.

b) Evaluation of resources consumed by activities

After identifying the activities, the determination and delimitation by the cost of consumed resources is required. In fact, if many resource consumptions are indirect in relation to products, they are direct in regard to various activities; therefore resources mobilized by support activities will no longer be distributed within product cost compared to arbitrary distribution base. The basic postulate of the method requires "ventilation", delimitation of indirect costs by activities with the informational support of the accounting management and budgets divided by responsibility centers.

Information collected in this phase should determine the resource drivers, namely the causal factors that justifies resource consumption for the best. This will be helpful in managing the activities and highlighting the most relevant performance indicators for determining the cost drivers.

The quality of the whole endeavor and the results provided by the ABC system are directly related to efforts to establish a dialogue between technical and economic personnel, charged with monitoring the implementation of this model.

c) The determination of cost drivers and calculation of unit costs per inductors

Grouping activities by the same resource inductor can be achieved by taking into account the current experiences, which will highlight them by four major possible types:

- activities related to production volume: privileged drivers are labor hours or machine hours;
- activities related to changes in batches or series: drivers are retained as number of manufacturing orders, number of manufacturing series;
- support activities for the cost objects: the main drivers are: number of components, number of technical changes;
- general support activities whose costs are independent of the volume and range of products: the inductor is a value indicator (such as value added); preferable, the costs of these activities not to be assigned to products, but directly to the results.

Based on the cost of activities at each group the unit cost of each inductor is determined by means of technical information about manufacturing conditions, allowing to determine the number of cost drivers (the volume of each inductor).

$$\text{The unit cost of the inductor} = \frac{\text{Cost of resources by activities}}{\text{Inductor's volume}}$$

Cost driver is the kind of unit of work, but it is important to emphasize that behind this appearance there are two very different logics. Logic of cost driver is a cost progressive development logic based on the principle of causality while working unit logic is a logic for referring the costs.

This means that choosing the required inductor and regroupings do not require the presence of product. Established drivers have no direct connection with products, while for the working unit this connection is required.

This is how, by this indicator, the cost of activities by products is calculated.

d) Assigning activities costs by costing items

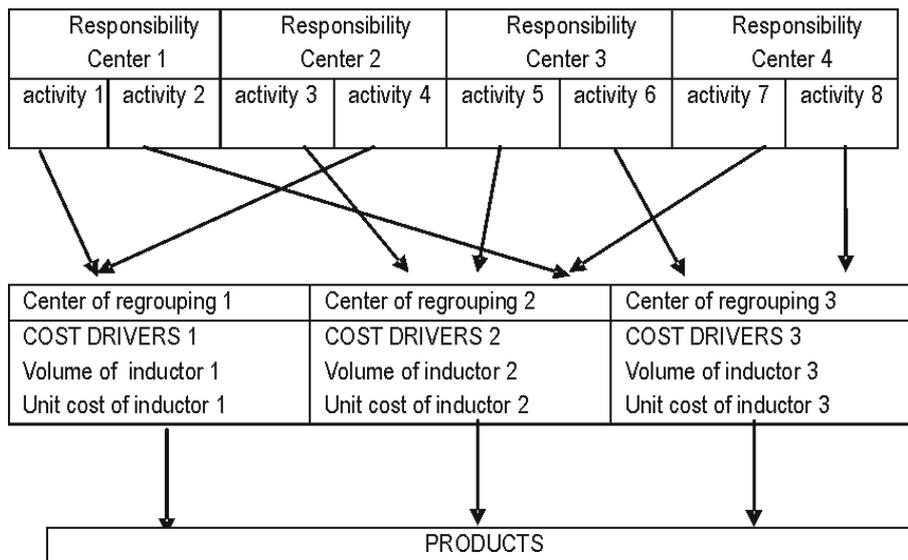
Most often it is about obtaining the complete cost of product, but the system, by its content, can allow to calculate the cost for other items: product lines, processes, clients, projects and organizational units.

For each object of calculation, activities needed to achieve it and the amount of inducers consumed by these activities are determined.

The cost obtained comprises direct costs (determined in relation to elements drawn from the list and the operative range) plus the cost of consumed activities (depending on the inductor unit cost for each activity and production volume produced), (G. Shillinglow 1989).

Thus, it is about a cost that can be classified as a "product attributable cost", from findings that the principle of causality resource consumption is always respected.

Global architecture model based on costing activities is as follows:



Source: G. Shillinglow, 1989

The cost drivers, their level, the cost per unit inductor and effectiveness, efficiency or quality inductors, are used to analyze how actions contribute to increase company's efficiency and performance. Increasing the company's performance cannot be achieved using only financial indicators.

Costs calculated by the ABC system tries to render as much as possible the reality concerning the consumption of resources generated by the products' emergence, complexity and manufacturing methods.

This method, after all, is based on two complementary orientations: one related to costs calculation and analyze and the orientation that targets the company's performance, as a measurement tool.

2. ABC generous benefits for managerial decisions

The ABC system, whose approach is still the subject of numerous examinations and discussions, gives answers to some concerns regarding current management control, both in terms of cost management and performance. Cost's relevance obtained by following the causal links between the products and the consumption of resources is an important advantage in terms of using this cost in making decisions regarding strategic management product portfolio.

Analyzing possibilities offered by the method are many, given the diversity of calculation objects (types of clientele, orders etc.) and annual budgets exceedings can provide the calculation of costs during the life cycle of products or specific projects that take place over several years. (Albu, N., Albu, C. (2003). Integrated to other methods, such as the "target cost" or project management, The ABC system can provide a reliable basis for policy guidance for sales pricing.

The ABC system allows equally a holistic and a "cross section" view, by processes, of the undertaking. Set up to establish a link between activities and the consumption of resources, this system aims to activities' management (Activity Based Management / ABM) providing answers to questions like:

Is it possible to suppress one activity or reduce its costs?

How can the various tasks involved in each activity be executed more effectively and efficiently?

How can it be acting over products from conception to reduce the consumption of activities and resources?

For management control, the measure of performance is facilitated in two ways: research into the causes is more pertinent given the relationship between resources, activities and products; performance's view is more global by highlighting the processes.

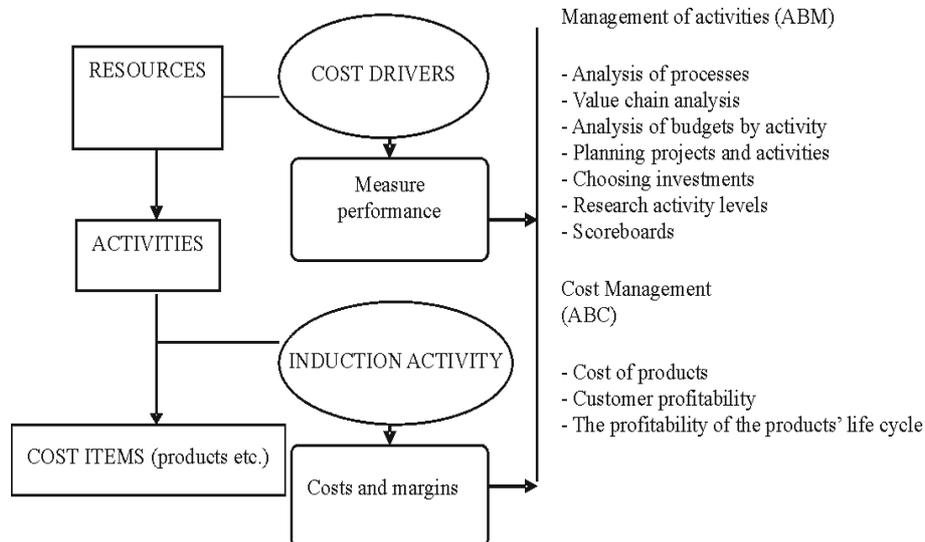
Uniform cost allocation by calculation objects determines:

- underestimating costs \ risk of selling products at a loss, exhaustion / waste of resources, becoming unable to operate further;
- overestimation of costs \Rightarrow risk of losing part of the market, unrealistic and uncertain forecast.

Possibilities offered by the ABC in performance management refers to the purpose of obtaining the differentiation capability by:

- analyze of ways to reduce costs and rationalize production by reducing the number of components or by limiting specific series;
- accountability of decision-makers concerning the costs, especially for support activities; better control of the costs of launching new products or those regarding changes to existing products;
- determining the management necessary indicators in a total quality approach and learning the cost of this activity.

All of these guidelines can be represented as follows: (P.L. Bacos, C. Mendoza, 1994):



Source: P.L. Bacos, C. Mendoza, 1994

The ABC system serves management decisions, especially regarding resource assignment. This trend can be traced from a forecasting perspective, using it to build budgets by activity or setting targets for cost of goods or determining conception results.

3. The ABC approach by national public sector institutions for rational managing of resources

In today's post-modern society, public entities cannot function and serve the citizens independently or above the economic environment. The resources for this purpose provided by national public sector should be employed effectively to meet the main needs collective or quasicollective. Such an approach implies a radical change in paradigm for the public sector to continuously increase the quality of services provided, which can only be achieved by amending public management, specifically through transfer and adoption of methods and management techniques from the private sector to public sector (state), recognized as New Public Management phenomenon.

Information needs of decision makers and managers of public services relative to costs in this context become diversified and increase the level of segmentation and joint of cost information whose obtaining and understanding need to reinforce theoretical and practical managerial skills to have the full potential benefits of scale offered by cost efficiency of internal processes.

The public institution gets valence of public "non-market" manufacturer and could be reconsidered and modular perceived, from this new perspective, by the premise of value chain concept. The paradigm shift refers to organizational mutation from administrative bureaucratic mechanisms to managerial tools, which makes public institution not to be understood as a passive consumer of resources (budgetary institution), but as a service provider for citizens. (SEC 2010).

The present approach starts from the study by accounting approach of cost information by orders method for central government public institutions using information material obtained to conduct a comparative analysis of information generated by implementing the ABC method at the level of one of the branches less investigated of institutional value chain, the financial and accounting services.

To this end, the administrative and management sector financial accounting link, namely Economic Department has undergone detailed examination - reconsidered as from the point of view of institutional chain's supplier/provider of financial and accounting services, in order to analyze whether the data and information obtained by ABC implementation provides more relevant information support, able to lead to a substantial improvement in decision-making in public resource management.

The main beneficiaries of Economic Department are directly serviced by the responsibility center established at the Treasury Activities Department, treasury

services being provided by two workers, whose salaries will be considered as direct labor.

After collecting, analyzing and sorting the data, managed by electronic information system revealed the following results:

Table - Stages of implementation of the ABC method

1. Delimitation of activities and responsables
2. Calculation of the cost elements of each activity
3. Quantifying the time constituent of activities' execution
4. Determining the cost of each activity according to the time of execution
5. Transposition of the total cost of each activity on cost objects
6. Calculate the total cost of cost objects

Table 1. Monthly Statement of budgetary expenditures for the economic function of the institution

Breakdown of expenditure according to budget classification		Economic Department	Total institution
1.	Staff costs	28,500.00	1,761,500.00
2.	IT and telecommunications	325.,00	2,968.00
3.	Water, sewer	62.45	1,562.90
4.	Illuminate	254.80	5,422.64
5.	Combustible	306.50	6,481.11
6.	Rents	550.00	10,000.00
7.	Miscellaneous supplies	250.00	1,748.00
8.	Books and Publications	120.00	1,340,00
9.	Heating	452.00	9,104.35
10.	Maintenance heating installations	156.00	5,658.00
11.	Current repair	240.00	7,715.00
12.	Depreciation of fixed assets	12,500.00	500,000.00
	Total	43,716.75	2,313,500.00

Source: elaborated by author

No specific driver was identified for administrative expenses. Therefore for their distribution the direct expenses value was chosen as a base. So the indirect

costs can be traced by activities and then being used to allocate the expenses to product.

To achieve cost calculation by activity, the cost grid related to direct expenses remains unchanged while the indirect expenses grid is added the cost of activities. For issuing the cost grid is very important to know for each activity, the level of cost drive associated to the service provided.

**Table. 2. Responsible performance
No.1 and No.2 Treasury Department Activities**

Name of work performed	Number of hours worked per month	Number of hours worked weekly	Amount salary Direct costs	Amortization amount Indirect costs	Amount materials and services costs
<i>Responsible performance No.1 Treasury Department Activities</i>					
Receipts and Payments	112.00	28.00	2,415.00	2,940.00	266.00
Issuing supporting documents	32.00	8.00	690.00	840.00	76.00
Registration of supporting documents	16.00	4.00	345.00	420.00	38.00
Total	160.00	40.00	3,450.00	4,200.00	380.00
<i>Responsible performance No.2 Treasury Department Activities</i>					
Receipts and Payments	152.00	38.00	3,125.00	600.00	380.00
Total	152.00	38.00	3,125.00	600.00	380.00

Source: elaborated by author

According to the ABC method, the cost driver is a measure used to assign causal and indirect costs related to activity provided by responsible no. 1.

The allocation of expenditures by major operational activities, costs by activities related to responsible no. 2.

The ABC method allows company managers to establish goals aiming at reducing costs in certain activity fields, and also to identify opportunities to improve the way in which various activities are provided and analyzing the possibility to exclude some of them.

Table. 3: Calculation of the total costs of the activities of the Economic Department

Name of work performed	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Budget and Accounting Service								31,831.75
Develop, monitor execution budget and budget reporting	64	16	1 5,950	2,380	733.34	186.35	18	183.32
Development and submission of financial balance and other reports	96	24	1 5,700	3,420	1,100.00	279.54	24	199.98
Checking and issuing documents supporting	256	64	2 5,500	8,800	2,933.33	745.43	3,242	3.85
Operation accounting transactions	256	64	2 4,738	7,575	2,933.33	745.43	2,624	4.29
Total	672	168	4 22,175	22,175	7,700.00	1,956.75		
Treasury Department Activities								12,135.00
Receipts and Payments	264	66	2	5,540	3,540.00	646,00	1,952	6.01
Issuing supporting documents	32	8	1	690	840.00	76,00	1,620	0.99
Registration of supporting documents	16	4	1	345	420.00	38,00	953	0.84
Total	312	78	2	6,575	4,800.00	760,00		
Total Ec. Dep.	984	246	2	28,750	12,500	2,716.75		43,966.75

Source: elaborated by author

Note: (1) Number of hours worked per month, (2) Number of hours worked weekly, (3) Number of workers, (4) Amount salary Direct costs, (4) Amortization amount Indirect costs (5) Amount materials and services costs, (6) Amount materials and services costs (7) Quantity cost drivers, (8) The total cost per unit of activity

The ABC method, viewed from a limited angle, is designed by mathematics as a method of a very strict cost sharing compared to general methods. From a broader point of view, this method tends towards profitability analysis.

Table. 4: Cost of structural unit of the Department of Economic

Number of beneficiaries	1865		
Structure	Number of workers	Total cost structure	Unit cost the beneficiary
Budget and Accounting Service	4	31,831.75	17.07
Treasury Department Activities	2	12,135.00	6.51
Total		43,966.75	23.57

Source: elaborated by author

If we use the number of beneficiaries served according to the method on orders, namely 1,500 beneficiaries of environmental approvals issued, results that the Economic Department plays a total cost of 35,362 lei (RON 23.57 * 1,500 beneficiaries = 35,362 lei).

Absolute Aberrance to ABC is 8604,75 lei, and the relative one is 24%, the latter being considered the degree of increase in the quality of information resulting from the implementation of cost ABC.

The cost drivers, their level, the cost per unit inductor and effectiveness, efficiency or quality inductors, are used to analyze how actions contribute to increase company's efficiency and performance. This indicator is useful in analyzing and identifying opportunities for improving the management accounting information system of existing, it can be generalized according to the following formula:

$$GCCIC = (CTCC_{i1} - CTCC_{i0}) / CTCC_{i0}, \text{ wherein:}$$

GCCIC = degree of cost increase information quality;

$CTCC_{i0}$ = total cost of the period analyzed for cost center and obtained by using existing management accounting system (initial);

CTCC_{i1} = the total cost for the period under review and achieved cost center with the new management accounting system was in the planning stage.

This significant difference can have positive cognitive dimensions throughout the value chain, significantly improving the evaluation, analysis and adjustment operations and institutional activities, the adoption of the ABC method as:

- adequately reflect economic reality and specific;
- more relevant and beneficial purpose for which it is intended;
- it is intelligible, understandable and assimilated;
- has a high degree of detail, is not ambiguous or redundant.

Therefore, its adoption in the public institutions reinforces the assertion born, moreover, from private sector experience, that "cost engineering activities is a return to the sources of inspiration for accounting, through its means resulting in the outlining more clear the relationship between cause and effect in terms of costs and institutional performance. (Ion Cucui, Mariana Man, 2004)

In conclusion, the cost driver is the causal factor that triggers the consumption of resources in order to complete an activity and determines the distribution of indirect costs by activities.

Conclusions

Increasing concerns about cost and performance in the public sector is evident internationally, developed countries experiencing decades of private sector management accounting innovations in the "affairs" of the public sector.

In exergue of charismatic authority, undeniably desirable, of those in the exercise of public function need to be engraved an ample space devoted to cost efficiency arguments performant oriented to widely believable results. The paradigm template shift from resources to consumer driving to force of the creator of public values was triggered by the ignition in force of preventing and mitigating debate over national budget deficits.

Accessing the invisible matrix of their costs through the lens of results from inner effort of the public entities in the multi-purpose social visual field, convert their status from "prisoners" of consumption at any price - endowed with "genetics" helplessness to bring benefits and due to which it is inferred that cannot be responsible - in effective of "official" performance providers, capable of eliciting a

reaction of profound and positive change in the area of public resource management.

Advanced synergistic articulation of information cost is further achieved by implementing an ABC system, although the realization of a theoretical system operating parameters ABC is a highly complex technological challenge, which requires personnel with higher skills and abilities, and undertaking long-term investment.

The consequences of failure for an unreasonable and discriminatory budgetary allocation, remains an alternative without logic, whether we are talking about social logic or, much less, about the competitive logic (3E economy, efficiency, effectiveness) (D. Tanasescu, M. Petrescu, F. Cucui, 2010), This logic need to be supported by management accounting information, thus extending its scope to nonmarket entities.

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