

REVISIÓN

Analysis of ABC Cost Systems

Análisis de los Sistemas de Costos ABC

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ABSTRACT

This article examines the implementation of the Activity Based Costing (ABC) system in contemporary business environments. The objective is to analyze the evolution and applications of ABC, highlighting its impact on decision making and profitability. The methodology includes a comprehensive review of the literature since 2021 in Web of Science and Scopus, using keywords such as “activity-based”, “costing” and “profitability”. The results underscore the positive impact of ABC in reducing production, sales and marketing costs. Integration with Resource Consumption Accounting (RCA) and approaches such as Time Driven Activity Based Costing (TDABC) shows effectiveness in sectors such as higher education and healthcare. In conclusion, ABC remains crucial for cost management and informed decision making, contributing significantly to operational efficiency and business competitiveness.

Keywords: ABC System; Profitability; TDABC.

RESUMEN

Este artículo examina la implementación del Sistema de Costos Basados en Actividades (ABC) en entornos empresariales contemporáneos. El objetivo es analizar la evolución y aplicaciones del ABC, destacando su impacto en la toma de decisiones y rentabilidad. La metodología incluye una revisión exhaustiva de la literatura desde 2021 en Web of Science y Scopus, utilizando palabras clave como “activity-based”, “costing” y “profitability”. Los resultados subrayan el impacto positivo del ABC en la reducción de costos de producción, ventas y marketing. La integración con la Contabilidad de Consumo de Recursos (RCA) y enfoques como el Costeo Basado en Actividades Impulsadas por el Tiempo (TDABC) muestra eficacia en sectores como la educación superior y la atención médica. En conclusión, el ABC sigue siendo crucial para la gestión de costos y la toma de decisiones informada, contribuyendo significativamente a la eficiencia operativa y la competitividad empresarial.

Palabras Clave: Sistema ABC; Rentabilidad; TDABC.

INTRODUCTION

The constant change in which companies are involved forces them to remain competitive in the market. One of the relevant aspects is the digital transformation that allows greater efficiency in companies' production processes of goods and services.⁽¹⁾ To date, an increasing number of companies, whether small, medium, or large, are choosing to implement the ABC system instead of traditional cost management practices to face competition at a global level. Innovative companies must effectively manage and reduce costs while offering competitive prices accurately and rigorously to stay in the market. This has become crucial in determining

actual costs and setting prices for their products and services. In particular, the ABC system improves stakeholder decision-making by providing more flexible costs that support the new business environment and competition locally, regionally, and globally.⁽²⁾

Although the conventional cost accounting system was and remains fundamental to quantifying production/ service costs, enabling managers to price their products to the user public while outlining their profitability, whether, in small and medium-sized enterprises (SMEs), their processes are evolving and aim to be more practical, agile and user-friendly, assisted by Information and Communication Technologies (ICTs).⁽³⁾

Furthermore, in conventional costing systems, accountants assign manufacturing costs to products but do not necessarily assign objective costs to each production process or direct and indirect services.⁽³⁾ That is why the main objective is to learn about the research published in recent years on activity-based costs and their influence on profitability.

METHODS

A review of the existing literature from the year 2021 in the Web of Science and Scopus databases will be carried out using the keywords “activity-based,” “costing,” and “profitability,” being “activity-based,” “costing” and “profitability” respectively in the title, abstract, and keywords; and using the Boolean operator AND to limit what is to be investigated in full open access articles in English, Portuguese, and Spanish; excluding duplicate articles.

Table 1. Valid articles obtained by keywords, inclusion criteria and databases		
Keywords	“activity-based” AND “costing” AND “profitability”	
Within	Title, abstract and keywords.	
Inclusion criteria	<ul style="list-style-type: none"> - Journals and research articles were considered. - The journals and articles are found in the databases. - Articles from the year 2021. - Journals and articles must be complete and open access. - Journals and articles in English, Portuguese and Spanish. 	
Database	Shortlisted articles	Valid articles
Science Web	10 selected items	9 valid items
Scopus	10 selected items	3 items valid

RESULTS

About the ABC Costing System

In contemporary accounting approaches, Resource Consumption Accounting (RCA) provides high-quality data for accurate cost identification to optimize profitability through competitive pricing strategies. This methodology integrates the ABC costing system process with the advantages of the resource management approach.⁽⁴⁾

The ABC costing system positively impacts reducing production, sales, and marketing costs and facilitates accurate cost measurement. In addition, it promotes production efficiency and staff training in using ABC costing systems, resulting in increased efficiency and productivity. This approach contributes significantly to determining costs fairly and accurately, improving control effectiveness in administrative aspects and financial costs. In addition, the ABC costing system plays a vital role in pricing, process planning, and cost-reporting decision-making. Ultimately, it provides managers with the ability to make informed cost and pricing decisions, summarizing its impact on cost control.⁽⁵⁾

In the current context, where the incorporation of technology is essential in production processes to increase efficiency, the relevance of cost accounting and management in cost control and decision-making has been demonstrated, where the information generated by cost management is used to obtain a complete understanding of the total costs related to activity and, from that information, margins, and results are analyzed, which is essential in decision making.⁽⁶⁾

In a case study where programming by objectives was applied in the management of the 7P (product, price, place, people, process, promotion, physical evidence), a combination model of marketing in higher education helped in the determination of the total cost of the educational process using the ABC cost system, providing information that allows obtaining an estimated level of profitability.^(7,8)

Currently, companies have the customer as a more important asset than the product, analyzing and evaluating them and, according to this, determining the decision-making for production optimization.^(9,10)

Combining the ABC costing system with the theory of constraints (TOC), enterprise resource planning (ERP), and implementing Industry 4.0 allows for optimizing the product mix to maximize profits while minimizing environmental impact. This approach seeks to achieve an optimal product mix, considering environmental

factors to effectively balance profitability and environmental sustainability.^(11,12)

Time-Driven ABC Costs (TDABC)

The integration of the time-driven activity-based costing method (TDABC) and the theory of constraints (TOC) also allows the identification of bottleneck activities, which occurs when the practical capacity of production activities is lower than the capacity required for the production of products; it can be stated that there is a capacity constraint or a bottleneck in that production activity. There is a necessary capacity on the part of the production activities to meet the required quantity of the requested product in a relevant period established by time equations, which is a constraint function. Thus, the theory of constraints (TOC) serves as a guide to identify bottlenecks and is also used to optimize operational processes.^(13,14)

It should also be considered that companies currently conduct operations in the online channel and that within the entire cost structure, production and transaction costs must be considered, considering new daily collection and delivery operations; the novelty of the time-driven activity-based costing (TDABC) method lies in its ability to provide a thorough analysis of the costs related to the electronic fulfillment of products and services, providing the ability to more accurately calculate the profitability of their business operations.^(15,16)

In the context of the healthcare industry, characterized by a significant diversity of human resources with variable costs, the time-driven activity-based costing (TDABC) approach offers the ability to obtain a more accurate representation of the cost structure and to access more relevant information. It also facilitates a more complete understanding of revenues and expenditures, identifies unused human resource capacity, and provides a solid basis for improving resource management by healthcare providers. Overall, it is presented as an effective solution for cost control and containment of price inflation in the healthcare sector.^(17,18)

The time-driven activity-based costing system (TDABC) approach allows accurate identification of the time and labor required for production. In the area of plastic costs in composting, the evaluation of the costs associated with plastic in composting and its subsequent disposal is performed, and it is relevant to mention that, although the results have not yet been validated, it is expected that the reduction of contamination by inorganic substances can boost profitability.^(19,20)

An analysis of the classical Cost-Volume-Benefit (CVP) model, based on the Time-Driven Activity-Based Costing (TDABC) method, provides a more accurate cost allocation. This approach makes it possible to accurately identify the “profit illusion” in the revenue generation of each product. It also makes it possible to quickly adjust and optimize the product structure, allowing decisions to be made with precise corrections and adjustments. In addition to helping to determine a more accurate break-even sales volume, this method is more suitable for improving the accuracy of cost allocation and obtaining more reliable conclusions.^(21,22)

Cognitive Time-Driven ABC Costing (CTABC)

Recent studies on cognitive time and the scope of activity-based costing delve into the distortion of cognitive time (CTD) and actual time over activity and how it significantly affects profitability, proposing the cognitive time-driven activity-based cognitive costing (CTABC) system offering a change in the profitability of activities proportional to 0,56 compared to the time-driven activity-based costing (TDABC) system that does not consider the provision of cognitive time.^(23,24)

DISCUSSION

Contributions of the ABC Costing System

The results obtained from the literature review highlight several positive aspects of the ABC Costing System. First, it positively impacts cost reduction in several areas, such as production, sales, and marketing, in addition to its contribution to production efficiency and personnel skills development. These improvements translate into more informed decision-making on costs and prices, thus improving administrative and financial control.⁽⁵⁾

Integrating the ABC Costing System with Resource Consumption Accounting (RCA) is a valuable strategy to optimize profitability through competitive pricing strategies. This contemporary approach integrates the ABC system with resource management, providing accurate data for cost identification.⁽⁴⁾

In addition, it highlights the relevance of the system in the context of technology, where the information generated by cost management is used to understand the total costs associated with an activity. In higher education, the ABC system helps determine the total cost of the educational process, providing crucial information for estimating cost-effectiveness.⁽⁷⁾

Complementary Approaches to the ABC System

The article also discusses complementary approaches to the ABC Costing System, such as Time Driven Activity Based Costing (TDABC). Combined with the Theory of Constraints (TOC), this method not only identifies bottleneck activities but also adapts to online operations, providing a detailed analysis of costs related to the electronic fulfillment of products and services.⁽¹¹⁾

In the healthcare sector, TDABC is an effective solution for cost control and price inflation containment, providing a more accurate representation of the cost structure and a more complete understanding of revenues and expenses.⁽¹²⁾ Also, its applicability in the environmental arena is highlighted, where it seeks to effectively balance profitability and environmental sustainability.⁽⁹⁾

Innovation with Cognitive Time

Recent research also introduces the concept of cognitive time-driven activity-based Costing (CTABC), exploring cognitive time distortion and its impact on profitability. This proposed approach, which considers cognitive time, is presented as an innovation with a change in the profitability of activities.⁽¹⁵⁾

CONCLUSIONS

A comprehensive review of the literature on Activity Based Costing (ABC) reveals its growing relevance in a business environment characterized by digital transformation and the constant need for efficiency. ABC has proven valuable for cost management, informed decision-making, and profitability optimization in various areas and sectors. Integrating ABC with complementary approaches, such as Resource Consumption Accounting (RCA), Time Driven Activity Costing (TDABC), and Cognitive Time (CTABC), broadens perspectives and offers innovative solutions to specific challenges. Combining ABC with RCA highlights the importance of obtaining accurate data to identify costs and optimize profitability through competitive pricing strategies.

In the technology arena, the application of ABC improves production efficiency and provides crucial information for a complete understanding of the total costs associated with an activity. Furthermore, the adaptability of TDABC to online operations shows the versatility of this approach in modern business environments. In the healthcare sector, TDABC presents itself as an effective tool for cost control and price inflation containment, highlighting the importance of accurately representing the cost structure and a detailed understanding of revenues and expenses. Combining ABC with the Theory of Constraints (TOC) and implementing Industry 4.0 seeks to effectively balance profitability and environmental sustainability.

The introduction of cognitive time-driven activity-based Costing (CTABC) represents an innovation that considers cognitive time distortion and its impact on profitability. This approach, although nascent, offers an exciting perspective for improving accuracy in cost allocation and decision-making. Ultimately, the literature reviewed underscores ABC's continued importance and ability to evolve and adapt to the changing demands of the business environment. As companies seek efficiency, informed decision-making, and sustainable profitability, ABC, along with complementary approaches, presents itself as an essential tool for achieving these goals in the modern business era.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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