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TOOLS FOR COST MANAGEMENT: DISCUSSION AND CHALLENGES

FERRAMENTAS PARA GERENCIAMENTO DE CUSTOS: DISCUSSÃO E DESAFIOS

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Abstract: This article aims to provide an overview of the literature in which cost assessment methods are currently used, and their characteristics and limitations are also pointed out. To achieve the proposed objectives, a Systematic Literature Review (RSL) was conducted. It was possible to identify the tools discussed in the bibliographic portfolio studied, namely: life cycle costing, target costing, the total cost of ownership, activity-based costing, variable costing, and mathematical models, as well as the difficulties in implementing these tools in different application contexts. It has also been noted that multiple tools are often employed in integrated methodologies to mitigate the inherent limitations of individual models when treated in isolation. The significance of this article resides in its contribution to the discourse on the evolution of cost management tools and their application within integrated approaches, particularly in addressing the typical challenges encountered in emerging business models.
Keywords: RSL. Accounting. Costs. Tools and Management.

Resumo: Este artigo tem como objetivo fornecer uma visão geral da literatura em que os métodos de avaliação de custos são usados atualmente, e suas características e limitações também são apontadas. Para atingir os objetivos propostos, foi realizada uma Revisão Sistemática da Literatura (RSL). Foi possível identificar as ferramentas discutidas no portfólio bibliográfico estudado, a saber: custeio do ciclo de vida, custeio alvo, custo total de propriedade, custeio baseado em atividades, custeio variável e modelos matemáticos, bem como as dificuldades de implementação dessas ferramentas em diferentes contextos de aplicação. Também foi observado que várias ferramentas são frequentemente empregadas em metodologias integradas para mitigar as limitações inerentes aos modelos individuais quando tratados isoladamente. A importância deste artigo reside em sua contribuição para o discurso sobre a evolução das ferramentas de gerenciamento de custos e sua aplicação em abordagens integradas, especialmente para lidar com os desafios típicos encontrados em modelos de negócios emergentes.
Palavras-chave: SLR. Contabilidade. Custos. Ferramentas e Gerenciamento.

1 INTRODUCTION

With the perception of the importance of competitiveness and innovation as market survival factors, discussions on cost management have become more frequent. This leads companies to invest in financial and cost analysis, which is taking up more

and more space and consolidating as a differentiation method in the competitive market (Fontoura; Teichmann; Deponti, 2018; Neto; Robles, 2019; Silva et al., 2020).

There are a large number of studies dealing with cost analysis, and many of them emphasize the importance of cost management for organizations (Bottani et al., 2020; Hofmann; Bosshard, 2017; Reinas; Marianob; Rebelatto, 2011; Rubin, 2017; Saraiva Júnior; Mesquita Tabosa; Costa, 2011).

For Oliveira, Lembeck and Wernke (2005), knowing the operating and marketing costs of a company is extremely important for the proper management of its production system. This is because it provides excellent support for decision-making and promotes the maintenance and competitiveness of the company in the market.

Moreover, cost management goes beyond the simple role of cost accounting. The focus should be on issues such as how costs are incurred and why they are incurred the way they are, so understanding their nature is essential to design a plan to reduce them (Inácio; Freitas, 2020; Omotayo; Bankole; Olanipekun, 2020).

Unlike financial accounting, management accounting has a visionary approach that aims to predict future situations and help managers make decisions (Carmo; Neto; Dutra, 2011; Magalhães; Neto, 2011; Hamad; Gualda, 2011). However, for companies to effectively manage their costs, tools are needed to ensure that their costs are appropriately structured (Campos; Gonçalves; Brandão, 2019; Grzebieluckas; Campos; Selig, 2011; Lizot; Trojan; Afonso, 2021).

Nevertheless, the changes in production systems and the related challenges may cause traditional cost accounting systems to lose reliability and become of little importance in supporting production in terms of cost reduction efforts. In this sense, there are calls for more appropriate systems that can represent system costs in more details (Al-Dahiyat; Al-Tkryty; Jaara, 2021; Aquino; Meneguette; Pagliarussi, 2012).

Hence, this article seeks to answer the following Research Questions (RQ):

- RQ1: What are the tools used by companies to manage costs?
- RQ2: What challenges do companies face in operationalizing these tools?
- RQ3: Do these tools meet the needs and demands of the market for efficient cost management?

Considering this, this study aims to review the literature on what tools are used by companies in a wide range of application contexts. In addition, it aims to highlight the challenges of implementation and application. It also aims to stimulate discussion

on the development of models as mechanisms to adapt to the new needs of companies and the market.

This article is structured as follows. In addition to this introduction, Section 2 outlines the methodological procedure used in the research, while Sections 3 and 4 present the results and conclusions of the study, respectively.

2 METHODOLOGICAL PROCEDURES

As a methodological procedure, a Systematic Literature Review (SLR) was conducted. Regarding its operationalization, this article was designed to take into account the methodology described by Tranfield, Denyer and Smart (2003), whose steps for implementation are shown in Figure 1.

Figure 1 - Steps for conducting the SLR

Source: Adapted from Tranfield, Denyer and Smart (2003).

Research design is one of the most important stages of planning the review. This stage defines the questions that will guide the entire research and this procedure is an iterative process to refine the scope of the study. Thus, the RQs outlined in the introduction section of this paper were delineated for this research.

The second phase consisted of conducting the research. The articles relevant to the topic were identified, selected, and evaluated in order to extract the relevant data. This allowed the questions posed in the previous phase to be answered, the results of which are summarized in the findings.

In order to accomplish this, was conducted a search on Scopus database, considering a temporal scope from 2011 to 2023. To do so, the following search string was used within article title, abstract and keywords: *“cost management” AND (tool OR method OR model)*. Furthermore, the search considered only “articles” and “reviews” (document type), as well as only papers written in English and Portuguese (language), through the filtering mechanism available within the database itself. Table 1 summarizes the selection stages leading to the analyzed Bibliographic Portfolio (BP).

Table 1 - Definition of the BP

Selection Stages	Nº of articles
Initial search result	1,629
After filtering by document type and language	927
After titles, abstract, and keywords evaluation	179
Number of articles without access	35
Bibliographic Portfolio	**144**

The following exclusion criteria were used for evaluating the articles:

- Articles containing the search terms only as cited expressions;
- Articles that do not fit the scope of this research.

Once the bibliographic portfolio was defined, it was analyzed through spreadsheets used for tabulating the metadata extracted from the articles, as well as the use of the VOSviewer and Rstudio (bibliometrix) softwares for geographic density, and network analysis, respectively. Subsequently, a content analysis was conducted to extract the specificities of each cost management tool identified in the literature.

Finally, the last step is the preparation of the report and the publication of the results. This is what the main purpose of this study aims at, the contribution to the body of knowledge on the subject from the findings and recommendations for future studies according to the insights generated.

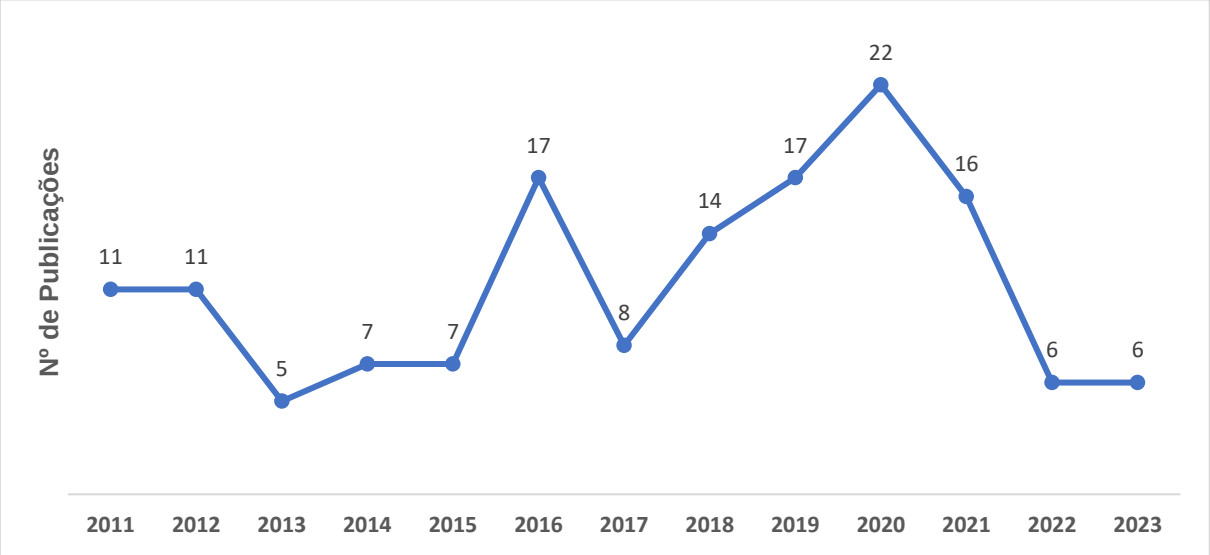
3 RESULTS AND DISCUSSION

In this section, the results obtained from the analysis of the BP will be discussed. Starting with a descriptive and network analysis of the articles to bring an initial perception and characterization.

3.1 BP characterization

The characterization of the BP is based on the basic understanding of the behavior of articles regarding their distribution and relevance in the academic environment. Figure 2 shows the evolution of publications when evaluated year by year.

Figure 2 - Evolution of publications

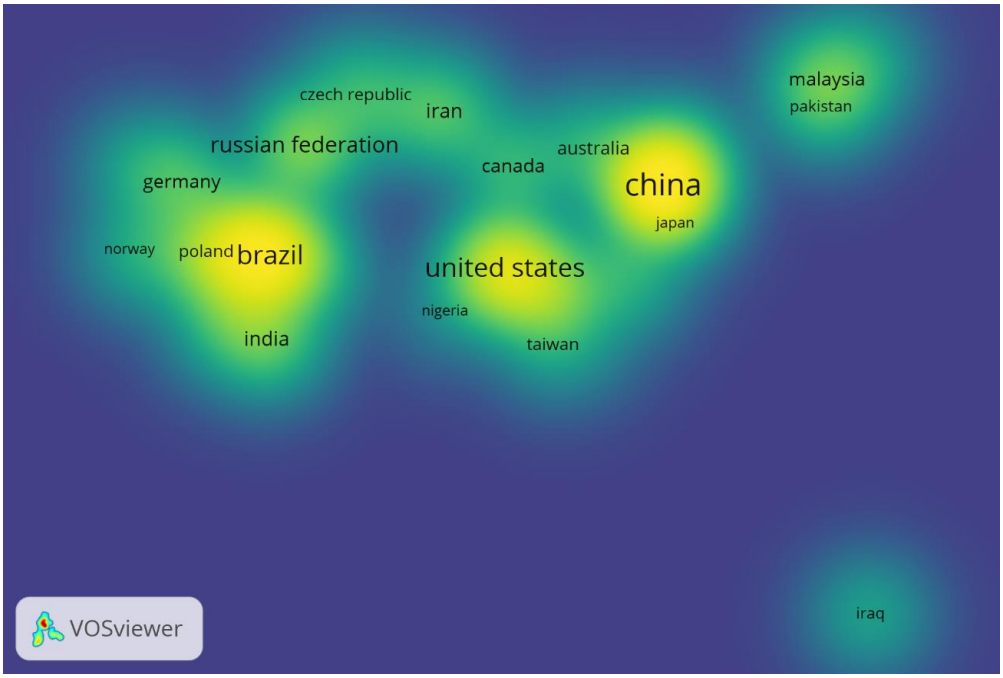


From Figure 2, an irregular behavior of publications over time is noted. However, there has been a positive growth in recent years, peaking in 2020 with 22 articles. This fact may be attributed to the need for organizations to reduce costs to maintain operations during the period of the Covid-19 pandemic (Florea et al., 2023; Rahimi et al*., 2023)*.

When evaluating the document types of BP, it is noted that a very small portion of it deals with literature reviews (approximately 2%), while the majority of the papers consist of empirical studies on the topic (approximately 98%). However, review papers aim to establish the state of the art of a particular topic and identify theoretical gaps for potential future research, which contributes to the preservation and creation of scientific knowledge (Moreira, 2004), reaffirming the need and importance of this article.

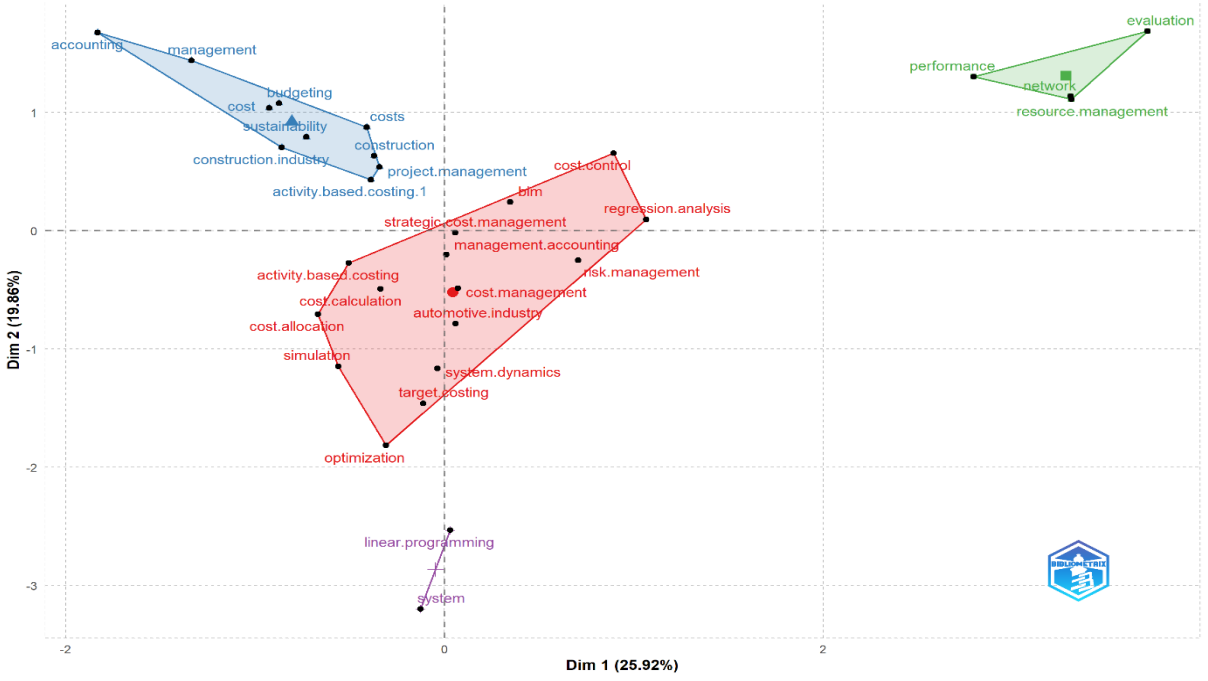
Changing the perspective of the analysis, Figure 3 deals with the publication density by country and shows Brazil, The United States, and China as the countries with the highest scientific production in the BP.

Figure 3 - Density map of sample publications



Finally, a map of the conceptual structure was constructed (Figure 4). Multiple Correspondence Analysis (MCA) method was adopted to identify the main concepts of the field, and the K-Means clustering algorithm was used to form clusters of articles expressing the same concept through their keywords (Aria; Cuccurullo, 2017).

Figure 4 - Conceptual structure map



In Figure 4, the results can be interpreted based on the degree of proximity of the points, grouped by different colors. From its analysis, it is possible to infer the existence of four thematic clusters in the sample, one for each color in the figure. Regarding these groupings, it is important to highlight the following relationships:

- Blue Cluster: indicates the relationship between themes such as cost management, sustainability, and project management;
- Red Cluster: correlates themes of strategic cost management, risk management, and optimization;
- Purple Cluster: Addresses mathematical modeling as a cross-cutting theme in cost management;
- Green Cluster: Points to scientific productions that relate costs to themes such as performance, collaborative networks, and resource management.

3.2 Cost management and the market

Cost management is a crucial factor in the performance of companies, and it is clear from the analysis of Figure 2 that increasing importance is being attached to the subject discussed here. According to Novák and Popesko (2014), this increase is reflected not only in the need to use methods and cost controls in companies but also in the quality of information and the ability of models to capture the nuances of production systems.

The changes in the globalized market and the search for competitive advantage have contributed to the development of business models and the consequent increase in the complexity of processes in companies (Ji; Abourizk, 2018; Mijoè; Starèeviæ; Mijoè, 2014). This new reality is characterized not only by changes in the process and product structures of the production system but especially in the cost structure (Blank et al., 2015; Delalibera; Lima; Turrioni, 2015; Soler et al., 2015).

In the past, the cost structure consisted mainly of direct manufacturing costs, i.e., materials, wages, and operation of the production plant, which accounted for about 90% of the industry's costs. However, today's reality is different, as the reversal of attention paid to indirect production costs is justified by the introduction of new variables in the system management, such as the need for marketing, sales

management, and communication (Megliorini, 2007; Muha, 2019; Novák; Popesko, 2014).

This inversion of the cost structure poses a problem for companies. As the traditional cost measurement models focused on production volume are no longer efficient to structure the costs of the system due to the emerging complexity (Ghaderi; Moradhasel, 2021; Hofmann; Bosshard, 2017; Raiko et al., 2020).

It is in this context that modern cost management models emerge. These models were developed in response to the new market needs for reliable and realistic information that can support strategic decision-making by top management in organizations (Leoncine; Bornia; Abbas, 2013; Novák; Popesko, 2014).

Despite this, the complexity of modern production systems has highlighted the need to use more than one cost measurement method in an integrated approach. Using two or more methods together, or even using them together with an additional production management method, becomes relevant when addressing the limitations these methods have when used in isolation (Son; Ryu, 2015).

In the study published by Lizot, Trojan and Afonso (2021), the authors highlighted the joint application of different methods as a way to improve the cost management of small farms in the agricultural sector. According to the authors, the lack of efficient cost management methods is a factor responsible for the low competitiveness of the vast majority of small farms in the sector. Even though the method presented by the authors, the Total Cost of Ownership (TCO), is suitable for management, its application is certainly affected by the lack of information. However, this problem was solved by the experience of manufacturers captured by the multi-criteria approach of the model.

Similarly, Wang, Chang and El-sheikh (2012) and Wang et al. (2020) took advantage of mathematical modeling to mitigate the limitations of their cost management models. By using Monte Carlo simulation in risk assessment in construction project cost management and dynamic systems modeling in identifying correlations in the behavior of cost items in the energy sector.

In analyzing the item portfolio, it is also found that the use of activity-based costing (ABC) is complementary. This fact confirms the limits imposed on the method and the need for organizations to provide management information beyond cost data, but for process improvement and value creation (Al-Hashimi; Jabbar, 2019; Botín;

Vergara, 2015; Mehdi; Reza, 2012), profitability and economic management (Leoncine; Bornia; Abbas, 2013; Moreira; Melo; Carvalho, 2016) and quality throughout the product life cycle (Mijoè; Starèeviæ; Mijoè, 2014; Tsai et al., 2014).

In addition, it is part of business strategies to determine the target costs to be achieved by companies, preferably still in the product and/or production system design phase. To achieve both objectives, the Life Cycle Costing (LCC) and Target Costing methods are efficient when used together, as presented by Abd and Jasim (2019).

3.3 Cost management tools and their challenges

The discussion of cost management tools identified from the analysis of the BP is presented below.

3.3.1 Life cycle costing

Life Cycle Costing (LCC) is a cost measurement model that can be used to evaluate the sum of all costs incurred throughout the useful life of an asset, service, structure, or system (Mésároš et al., 2021; Wang et al., 2020).

Complementing, Knauer and Möslang (2018) define LCC as the assessment of all costs incurred during the life cycle of a product that relates to one or more agents directly involved in the cycle, whether supplier, producer, or consumer. When considering factors that are external to the system, but which may ultimately internalize the framework of analysis variables for management decisions.

It is used in various contexts, from structuring fixed asset costs in projects to analyzing the current structure of an organization, which enables strategic considerations by managers (Zhao; Wu; Liu, 2021) such as the decision to discontinue a production line or not.

The main significance of the method lies in the need for organizations to adhere to the life cycle cost of their products. They avoid developing new equipment and purchasing assets at the lowest immediate cost, neglecting the high maintenance and operating costs of these items later in their useful life (Knauer; Möslang, 2018).

An advantage of this costing method is the better visibility of the costs in the system and the project control, while it is an efficient tool for the analysis of comparison

scenarios between different projects/products. On the other hand, it is a complex execution method where the information required for its application is difficult to access. Moreover, the analysis focuses on costs, without much openness to external variables when it comes to environmental, social, or other aspects (Gu, 2017; Li et al., 2016).

The main limitation is that this method is deterministic and therefore has difficulties in analyzing scenarios with stochastic processes and random variables that often determine the nature of the real problems studied (Wang; Chang; El-Sheikh, 2012).

3.3.2 Target costing

It is possible to think of target costing as a cost management system that focuses on price, customer, and project by incorporating various organizational functions (Abd; Jasim, 2019; Mao; Chen, 2021; Toosi; Chamikarpour, 2021). Its main objective is to adjust the operating cost of a product, i.e., a good or a service, to determine the target price and desired margins in the context of the company's strategic planning (Baharudin; Jusoh, 2019; Homburg et al., 2021a).

Its main characteristic resides in the target profit even in the product and system design stage, which leads to necessary changes in the costing structure. The cost is determined by the selling price, to optimize the total cost to the consumer without compromising the quality level of the final product (Nesterov; Yankovskaya; Kozlova, 2020).

In this manner, it is a tool capable of generating a synthetic report with the most relevant information on the composition of prices and costs, which helps managers to improve the knowledge of their activity segment (Mijoè; Starèeviæ; Mijoè, 2014).

However, its operationalization requires companies to have a detailed understanding of the product to be manufactured in terms of its physical characteristics, as well as the production system and operational methods. The data used to generate the information must be as realistic as possible, and there is not always this economic-financial control by the organizations, especially in the case of small companies, which limits the use of the method (Homburg et al., 2021b).

3.3.3 Total cost of ownership

Total Cost of Ownership (TCO) is a cost management method that considers the sum of all costs associated with a company's assets during its life cycle. In other words, it can be understood as all the costs associated with the acquisition, use, and maintenance of a product, whether it is a good or service (Durán et al., 2023; RODA; MACCHI; ALBANESE, 2020).

In the literature, the concept of the TOC is closely related to the concept of LCC of the product/system. Both aim to reduce the cost of ownership of the organization's assets. Although some authors emphasize the strategic connotation of TCO compared to the generalist model of LCC (Gram; Schroeder, 2012; Gu, 2017; Zhao; Wu; Liu, 2021).

Lizot, Trojan and Afonso (2021) emphasize that some TCO models have in their structure the ability to analyze the hidden costs that are often associated with system losses. In considering these cost items in the analyzes, the models must account for the uncertainties that arise from the occurrence of failures and performance degradation during the life cycle of a system. To this end, quantitative TCO models are needed whose characteristics of a plant under certain conditions are described based on historical data or static/dynamic forecast analyzes of its cost behavior throughout its life cycle.

The benefits of adopting this model in organizations range from performance evaluation, which proves to be a good conceptual framework for supplier evaluation, selection, and validation, to improved communication by creating a structured problem-solving environment that links other organizational functions to the purchasing function. Consequently, it provides useful information for the analysis of costs, suppliers, negotiations, and sales pricing (Roda; Macchi; Albanese, 2020).

In terms of the limitations of the method, limiting factors can be highlighted, such as challenges related to obtaining and ensuring the reliability of the data required to operationalize the model, difficulties in implementation and use, and challenges related to the organizational culture of companies adopting a biased perspective for short-term outcomes to the detriment of long-term management decisions (Zhao; Wu; Liu, 2021).

3.3.4 Activity-based costing

Activity-based Costing (ABC) is a management accounting support tool that allows you to assess the occurrence of costs in the execution of productive activities. Verifying how these activities are related to the generation of income and what their consumption of resources is (Alrashdan; Momani; Ababneh, 2012; Econ, 2021; Khushvakhtzoda, 2022; Stašová, 2021; Tirol-Carmody et al., 2020; Zhang; Li, 2021).

For authors such as Buys and Van der linde (2014); Araújo et al. (2020) and Elghaish e Abrishami (2020) the idea defended by the ABC method is that an organization's resources are consumed by the activities that compose the production process and not by the products it manufactures. So, it is possible to track which activities add value to the process and outline a plan for the efficient use of resources, optimizing financial results, and reducing operating costs.

Therefore, the method uses cost drivers in the appropriation of cost items to activities and later, to products. This cause-and-effect relationship between activities and expenses in the organization is a response given by the method to the limited allocation of costs based on the production volume adopted by traditional methods when considering the complexities of modern production systems (Silva et al., 2020; Sorros; Karagiorgos; Mpelesis, 2017; Van Tran; Nguyen Thao, 2020; Vásquez-Peñaloza; Otálora Beltrán, 2018).

Concerning its advantages, the ABC does not restrict the analysis to the product cost and its profitability (Delfim et al., 2023; Florea et al., 2023; Khataie; Bulgak; Segovia, 2011). Through the transparency allowed by the method, it is possible to analyze the costs incurred in the processes, promoting continuous improvement for the system. Unlike traditional models with greater emphasis on reducing direct costs that neglect waste arising from indirect expenses (Ding et al., 2022; Medianeira, 2011; Ostadi; Mokhtarian Daloie; Sepehri, 2023; Sampaio; Akahoshi; Lima, 2011; Stopka et al., 2021; Zaman; Elsayed, 2011).

However, as with other costing methods, ABC is not exempt from its limiting characteristics, which include: (I) the subjectivity in the relationship of fixed costs of activities with products through their drivers; (II) the little interest in the dichotomy of fixed and variable costs, simply appropriating these expenses to products and/or services, so that in doing so, the method would calculate high unit costs in a production

period below the normal capacity of the company and (III) the method does not consider in its analysis advanced measurement concepts, such as opportunity cost and capital equivalence, hence, the costing objects are measured in a way that does not express their economic values (Cremonese; De Tomi; Neves, 2016; Kampf et al., 2016; Kastanioti et al., 2016; Pokorná, 2016; Stasova; Bajus, 2015).

In light of what has been presented, there are variations of the ABC method in the specialized literature, whose main purpose is to simplify and suppress the limitations highlighted in the original model, such as the Time-Driven Activity-Based Costing (TDABC), whose characteristics are similar to the traditional ABC (Gregório; Russo; Lapão, 2016; Lelkes, 2019; Ratnatunga; Tse; Balachandran, 2012; Reddy; Venter; Olivier, 2012).

The main difference between ABC and TDABC is in the nature of the cost drivers used in the model. All drivers adopted in TDABC are time-based, which for some authors are more accurate than the transaction-based drivers used in ABC (Fito; Llobet; Cuguero, 2018; Fontoura; Teichmann; Deponti, 2018; Lelkes, 2019; Rubin, 2017).

Also, according to costing build on activities and time, Siguenza-guzman et al. (2014) contribute by stating that although TDABC has its origins in the industrial field, this method has gained attention in other application segments due to its ease of implementation and accuracy of the information provided. For example, in cost management in academic libraries, where the study was conducted.

Another variation of the original ABC found in the literature was discussed in the work of Alsharari (2016), named Results-Based Costing (RBC). This method removes the focus given to activities and deposits it in the results generated in the system and, in doing so, allows organizations to correlate products and/or services with their costs and their value mission. For the aforementioned author, this allows for the improvement of the cost management and decision-making system since the RBC is centered on the connection between product costs and system performance. This connection gives these new cost management models the ability to incorporate competitive market conditions as an analysis variable (Alsharari, 2016).

In addition to what has been presented, the performance of processes in the production system is the focus of the Performance-Focused Activity Based Costing (PFABC) method discussed by Toosi and Chamikarpour (2021) in their study. The idea

behind this method is to assess the efficiency and effectiveness of activities to determine the performance of the system as a whole. Furthermore, its use allows identifying cost deviations, such as rate and value deviation.

Continuing the discussion about ABC and its variations, the Attribute-Based Costing model stands out. Developed from activity-based costing, Attribute-Based Costing aims to promote an improvement in cost management and support management decisions. Therefore, its analysis depends on the customers' wishes and specifications, seeking a balance between these costs with the company's strategic objectives, while maximizing the value of the products manufactured and/or distributed by it (Azeez; Kadhim; Kadhim, 2020).

3.3.5 Variable costing

Variable Costing (VC) it is a cost allocation methodology that differentiates costs into variable and fixed, allocating only the variable costs directly to the products or services (Neto; Robles, 2019).

Its main characteristic consists of the exclusive allocation of variable costs to products/services, with fixed costs being treated as expenses for the period. Such configuration allows the analysis of the participation of each cost component in the global value of the cost object. Thus, allowing managerial insights essential to decision making. The non-use of fixed costs in the operationalization of the model is justified by its independence from production, product, and manufactured volume (Bonfanti; Cittadin, 2019).

The purpose of this tool is to reduce the arbitrariness of apportionments related to fixed costs and, consequently, allow managers to correctly assess management decisions, based on the concept of contribution margin generated by each product. As discussed in the work by Ribeiro et al. (2019) who conducted a cost-volume-profit (CVP) analysis, i.e., the definition of the contribution margin, determination of the break-even point, and measurement of the operational safety margin for the agricultural production of corn and soybeans on a farm, providing effective cost control and greater support for managers.

Nevertheless, the VC method is limited to its managerial applications, and cannot be used for external audit purposes in publicly traded companies, nor in tax

accounting, since its use violates the basic accounting principles of the Realization of Revenues, of Confrontation and Competence (NETO; ROBLES, 2019). Another criticism of the method is the fact that it does not focus on the production process, demanding rigor in the treatment of information when separating variable cost items from fixed production costs (BONFANTI; CITTADIN, 2019).

3.3.6 Mathematical models

Regarding mathematical models, they are tools capable of evaluating and solving real problems from a conceptual representation of a system, whose variables that describe it are mathematically modeled (Ghaderi; Moradhasel, 2021; Hatsey; Birkie, 2020; Jafaripour; Sajadi; Molana, 2022; Klünder; Dörseln; Steven, 2019; Radionova et al., 2022).

The use of these methods is justified by the complexity of the problems presented, as well as the number of insights they offer managers as support for management decision-making in organizations. Like the study by Lee and Choi (2020) who proposed a heuristic approach, through mathematical modeling, to solve the pricing problem in a hospital network, considering the foreseen budget limitations.

The healthcare industry is not alone in benefiting from such applications. When analyzing the BP, there are articles related to civil construction (Omotayo; Bankole; Olanipekun, 2020), energy generation (Taheri; Salles; Costa, 2020), supply chains (Yousefi; Mahmoudzadeh; Jahangoshai Rezaee, 2017), horticultural (Carmo et al., 2011), hotel services (GUO, 2016), and industries in general (Carmo et al., 2011; Gao; Guo, 2018; Guo, 2016; Ivanova; Sikyr; Abrashkin, 2019; Ji; Abourizk, 2018; Lee et al., 2022; Martin et al., 2018; Orji; Wei, 2016; Phitthayanon; Rungreunganun, 2019; Raiko Et al., 2020; Zhai; Jiang; Pedrycz, 2013).

As discussed in section 3.2, it is possible to highlight the efficiency of such methods in dealing with the arbitrariness and limitations of cost management models, facilitating calculations and providing multidimensional perceptions of the problems (Cho et al., 2018; Hariba; Tukaram, 2016; Silva; Fortunato; Bastos, 2016).

Nonetheless, mathematical models are complex approaches to operationalize and require an extensive amount of data to validate their use. Furthermore, to enable the solution of the proposed problems, some simplifications in the models must be

considered, which may go against the reality (Ghaderi; Moradhasel, 2021; Hatsey; Birkie, 2020).

4 FINAL CONSIDERATIONS

This paper aimed to give an overview of the cost accounting methods used in modern companies and to show their operational limitations. It also aimed to discuss how these tools have evolved in the face of the new demands of an increasingly competitive market.

In view of what has been presented, the adequacy of the results in terms of the proposed objectives becomes clear when discussing the changes in the cost structure and its multiple dimensions in modern organizations and how the existing methods are configured to meet these requirements.

However, it is noted that the literature on cost management focuses on the application of more conventional methods. Consequently, there is a need to better explore the multidisciplinary ways of assessing costs, taking into account the relationships between the nature of costs and different organizational functions. Moreover, the sectors in which the work has been applied in the BP are repetitive and there is a lack of studies that diversify the research in a wide range of economic sectors, such as the ceramic industry, the oil and gas industry, and the service sector.

In this sense, the practical application of cost measurement and revenue calculation methods together with the modeling of intelligent and integrated production systems is recommended as a suggestion for future research. Characteristics of the new business structures that Industry 4.0 preaches, in unconventional and under-researched sectors in the literature, such as those mentioned above.

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