Target costing: model proposal for a small construction business

Sanailton de Lima Dias
Specialist in Controllership, Bidding and Public Management, University of Estado do Ro Grande do Norte (UERN), Patu/RN, Brazil.
ORCID: https://orcid.org/0000-0002-7449-1397
E-mail: sldias86@gmail.com

Francisco Tavares Filho (Corresponding author)
PhD student in Accounting, School Business, University of Vale do Rio dos Sinos (UNISINOS), Porto Alegre/RS, Brazil.
ORCID: https://orcid.org/0000-0001-6383-0800
E-mail: franciscotavares@uern.br

André Luis Korzenowski
Ph.D. in Production Engineering, Researcher Professor of the Graduate Program in Accounting, Business School, University of Vale do Rio dos Sinos (UNISINOS), Porto Alegre/RS, Brazil.
ORCID: https://orcid.org/0000-0002-7640-2845
E-mail: akorzenowski@unisinos.br

Moisés Ozório de Souza Neto
PhD student in Accounting, School Business, University of Vale do Rio dos Sinos (UNISINOS), Porto Alegre/RS, Brazil.
ORCID: https://orcid.org/0000-0002-2345-3497
E-mail: moises.ozorio@ufersa.edu.br

Rafael Ramon Fonsêca Rodrigues
PhD student in Accounting, School Business, University of Vale do Rio dos Sinos (UNISINOS), Porto Alegre/RS, Brazil.
ORCID: https://orcid.org/ 0000-0003-3617-5585
E-mail: rafaelrcontador@gmail.com

Abstract

The implementation of a cost control system in construction companies contributes to reducing resource losses in the production process and increasing business productivity and profitability, especially when it comes to small business, which normally do not have a planning system and efficient control. Therefore, this article aims to propose a target costing model for a small construction business, concerning the efficient evaluation of its costs for the maximization of profits in proposals to provide services to public entities. A case study is used, in which data collection occurred through a questionnaire, observations of the process of preparing financial proposals, other unstructured questions, and documentary search, whose approach includes descriptive and qualitative research. The survey results revealed that the enterprise has a cost control system, but is technologically backward. Besides, the enterprise already intuitively used the concepts of target cost in preparing budgets. After evaluating the costs, a target costing model was suggested for the enterprise to use as a parameter in the bidding processes, however, it was not implemented due to the current unfavorable conditions.

Keywords: target costing, construction, small business, bidding process

1. Introduction

Small businesses play a substantial role in the socioeconomic growth of a country, since they are important in generating employment and wealth in all sectors of the economy. But, although these companies contribute to local development, their economic performance is weakened for several reasons, such as lack of working capital and low level of business management, which contribute to the fact that 25% of companies in this segment in Brazil "close their doors" with only two years of activity; after five years this rate increases to over 50% (Mollo, 2015).

In the state of Rio Grande do Norte, the average mortality rate of smaller companies, with two years of life, represents 22% and, specifically in the construction sector, equals 28.5% (SEBRAE, 2016). This represents a warning situation for the local economy in this segment, both in the micro sense, because it affects individuals and families, and in the macro, due to the decrease in production and income distribution. In part, this scenario is related to the fact that many companies in the construction sector do not have a good cost control system, incurring excessive losses in the production of services and faulty production processes. This impacts the delivery value to the client and the profitability that the enterprise provides to its owners (Costa, Gonçalves, Silva, & Teixeira, 2014).

But this situation can be minimized with the adoption of management tools and cost control, such as the target costing applied to companies in this segment, which can be used for cost management and enhance the company's results, since this methodology is based on customer satisfaction and increased profitability of the business (Ofileanu, 2015). Thus, for construction companies to achieve business goals, they must calculate the target cost based on market price and take joint action with all sectors of the company in order to reduce the actual cost of construction (Romanova, Popova, Slatvitskaya and Mironova, 2017).

In this perspective, we highlight the construction services arising from contracting through bidding,

whose global value of the contract and other information about the project are known from the publication of a public notice, enabling interested companies to project the financial proposal in advance. However, some construction companies may encounter difficulties in preparing the budget that underlies the proposal, consequently leading them to lose contracts with the public sector by presenting higher prices than other competing companies (Kern, Soares, & Formoso, 2006). Therefore, the target cost can be used by micro and small companies that operate in the construction industry and participate in public bidding, to prepare their financial proposals based on the acceptable price stipulated by the service contractor (Ribeiro, 2003), mainly because this cost control technique is applied primarily to products in development phase, which proposes the projection of costs from the price preset by the market.

Based on this context, the following question arises: how to develop a target costing model to assist the manager of a small construction company to efficiently evaluate costs and maximize profits in price proposals for public contracts? Therefore, the objective of this study is to propose a target costing model for a small construction company that can assist it in efficiently assessing costs and maximizing profits in proposals to provide services to public entities.

In practical terms, the study contributes to improve the cost analysis of a small business in the construction industry, with the purpose of assisting management in the preparation of competitive financial proposals in public bidding processes, as well as obtaining greater profitability in the execution of works, due to a more efficient cost management. In theoretical terms, the article discusses the target costing models applied to construction companies, especially about their use in small companies in this sector. On the other hand, this work contributes to an academic research project of a state public university, which aims to investigate management accounting artifacts for the improvement of small business management.

2. Theoretical Foundation

2.1 Cost Control in Construction

As stated by Sanches, Silva, Sanches, Melo and Matos (2018), companies are inserted in a changing environment and require strategic cost management to assist them in decision making. In the case of construction companies, this management becomes even more important because, according to Costa et al. (2014), in this sector there is a high waste of materials, labor, and lack of effective control in the construction process.

There are several ways to control costs and ensure the competitiveness that companies are so eager to achieve. In this sense, Bomfim, Santos and Santos (2017) report that cost control tools can be adopted to generate information in order to minimize costs, improve production processes, assign value to costing components and suppress waste, such as Reichskuratorium fur Wirtschaftlichkeit (RKW), Activity Based Costing (ABC), Standard Costing, Variable Costing, Absorption Costing and Target Costing. This study prioritizes discussions on target costing as an artifact for cost planning and control in construction companies, mainly because the purpose of target costing is to minimize product life cycle costs so that profit is maximized (Feil, Yook, & Kim, 2004).

2.2 Target Costing Applied to Construction

Cooper and Kaplan (1999 as cited in Zimina, Ballard, & Pasquire, 2012) report that target costing emerged in Japan's manufacturing industry with the purpose of managing and reducing costs in the new product development process. This cost control tool has become an important tool for strategic planning, management, and profitability because it helps ensure that new products and services meet the prices determined by the market and provide financial benefits to entities. The target costing must be based on the price that the consumer is willing to pay for the product or service, and from this price the company determines an allowable profit margin to obtain an acceptable cost (Guadanhim, Hirota, & Leal, 2011; Pacheco, 2015).

Thus, target costing should be understood as a strategic approach to cost planning and not just as a simple cost reduction method (Kron & von der Haar, 2016). Instead of considering costs as the outcome of a project, they are considered as a significant guidance tool in the product development process (Zimina et al., 2012).

Ahn, Clermont, and Schwetschke (2018) write that the literature contemplates three main characteristics of target costing. Market orientation is one of them, as market cost information takes the central role of cost-effective product development. Another characteristic is forward-looking cost management, as it emphasizes cost management during product development, enabling maneuvering for cost improvements with a focus on profitability. Finally, cooperative efforts (another characteristic) of expert people are required to achieve the desired target cost.

In turn, based on the literature on the subject, Sobotka and Czarnigowska (2007) describe seven steps of the target costing process, with the aim of establishing the target cost and achieving it in practice, as follows: 1) define customers' needs and expectations for the new product and the price they would be willing to pay for the value the product offers them; 2) calculate the allowable cost of the product as a difference between the market price and the profit margin resulting from the organization's strategic goals; 3) calculate the possible current cost of the new product as if it were to be produced using methods currently used by the organization; 4) calculate the target cost reduction as a difference between 3), and 2) because only by reducing costs by this amount can the organization achieve its strategic objectives; 5) design the product with respect to customer needs and target cost constraints in terms of the product's lifetime cost; 6) monitor the effects of the process: customer satisfaction levels, the level of current costs, and the achievement of the organization's goals; 7) continuous search for cost improvements during the production phase.

In the context of these steps, Sobotka and Czarnigowska (2007) explain that target costing is a long-term process that aims to achieve the future product cost that is optimal from the point of view of the organization's strategy and its market position. Therefore, according to the authors, the target cost should be low enough to allow the organization to profit from the sales of its products at the prices set by the market.

Although the target costing is widely used in the manufacturing industry, its applicability in the construction segment is possible from the interaction of all sectors of the company in the project design and the use of quality information for decision making (Morais, Granja, & Ruschel, 2015). This is due to the fact that the target costing is configured as an effective cost control system, besides helping those

involved in the development of new products, under the premise of reducing the inputs consumed without losing the quality and the added value perceived by the customer. Thus, Zimina et al. (2012) argue that the use of this costing technique in construction companies promises benefits such as, for example, project delivery at reduced cost without losing the contracted quality and deadline.

Ballard and Reiser (2004) point out that the applicability of target costing in construction is based on the manufacturer's relationship with the supply chain, given that the main characteristic of this methodology is cost reduction and value delivery to the customer via constant negotiations with the company's main suppliers. Based on this assumption, the applicability of target costing in construction can be seen in projects contracted as from project preparation or in contracts arising from public bidding, where the services and the amount of resources available to execute them are already known in advance as from the publication of the public notice.

However, according to Formiga (2006), the costing systems of construction companies are based on the traditional budget composed of unit prices of services, indirect costs and profit margin. However, using only the budget as a basis for cost projection, the company is prone to the loss of competitiveness and profitability, and to incurring losses.

In the case of public bids, the companies interested must seek the call for bid, which is usually a public notice containing all the specifications, to prepare and submit proposals to the Government. It should be emphasized that Law 8.666 (1993), article 45, Paragraph One, Subparagraph I, describes how the Government must choose the winning bid: “when the criterion for selecting the most advantageous bid for the Government determines that the winning bidder will be the one that submits the bid according to the specifications in the bid invitation or invitation and offers the lowest price.”

So, the elaboration of a competitive price proposal becomes essential for the success of the enterprise. When participating in a bidding process, the company can prepare a proposal that exceeds the competing companies. But if the winning proposal is below acceptable cost standards, the company may present a negative result and not obtain the expected profitability. Therefore, the adoption of target costing as an aid tool for the formalization of proposals may reduce the inherent risks of a budget prepared in error.

2.2.1 Target Costing Models in Construction

Some studies have addressed target costing models applied to companies in the construction industry. The study by Formiga (2006), for example, contemplates a model for applying target costing to the preparation of construction budgets, as shown in Figure 1. In this model, the elaboration of the proposal is conditioned from the previous knowledge of the project and its architectural specifications, as well as the price for the total execution of the contracted services.

In the first phase, as shown in Figure 1, meetings are held with the company's departments: the executive, the engineering sector and the budget engineer and the budget team. Deadlines are discussed, prices from previous bids are compared, and the choice of suppliers is made. In this phase, the suppliers are very important to achieve the defined target cost. In the second phase, if the target cost is not reached, price analyses of similar proposals can be made, renegotiations with the main suppliers can be made, indirect costs can be reduced, and, finally, the proposal can be finalized and presented to the customer.

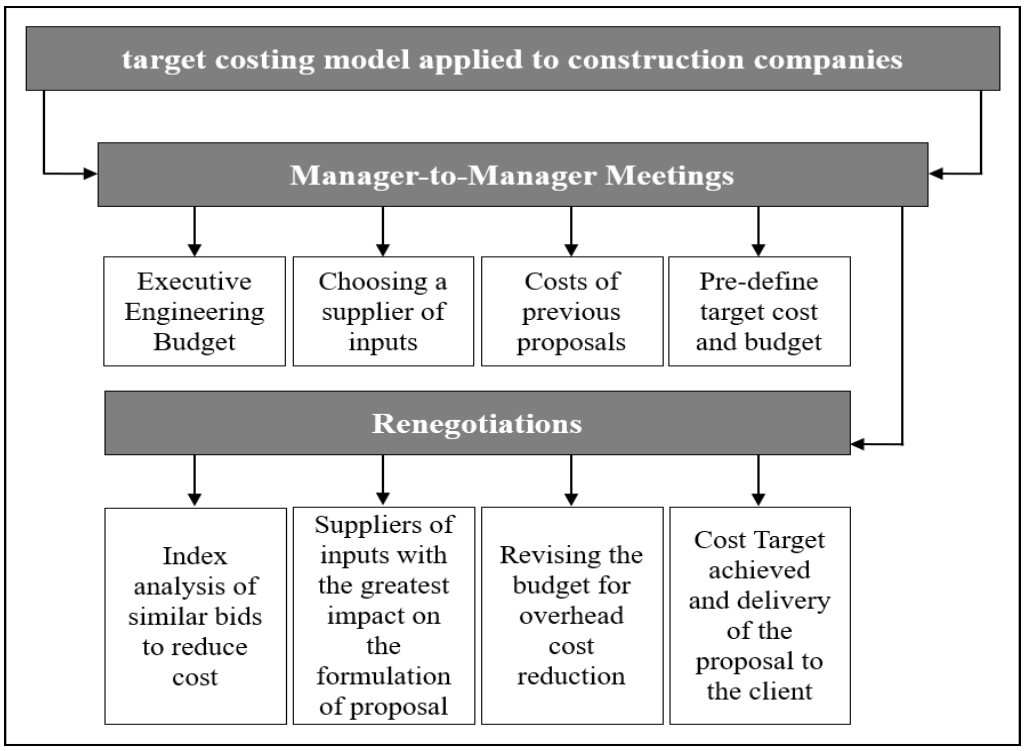

Figure 1. Application model of target costing in construction

Source: Prepared by the authors based on Formiga (2006).

Another model of target costing applicability in construction was presented by Kern et al. (2006), who concluded that the company studied applied the concepts of target costing and was successful in three stages, as shown in Figure 2.

In the first stage of the model (Price Formulation), according to Figure 2, the company formulated the bid proposal based on the price of the work and on the preliminary analysis of the project and its quantities. In addition, it checked the prices of similar works arising from past bids. In this perspective, Sobotka and Czarnigowska (2007) reiterate that in the Public Service the selection process of the contractor (usually through the most advantageous proposal for the management) happens in successive stages, starting with the conception of the project and the choice of the project design. However, this takes time and the initial price analyses by the bidder can become outdated. Therefore, if the sums of the bids are higher than the initial budget, it may be necessary to adjust the budget or redesign the project. It is also possible that the bidding procedure will be repeated, and that this will cause financial and time losses for the participants in this contract.

A poorly prepared project can favor the absence of companies in bidding processes, since they will cost more than the amount paid by the public entity to meet the specifications agreed upon in the contract for price, design, and functionality, delaying the construction of a hospital, for example, and harming the residents of a certain locality.

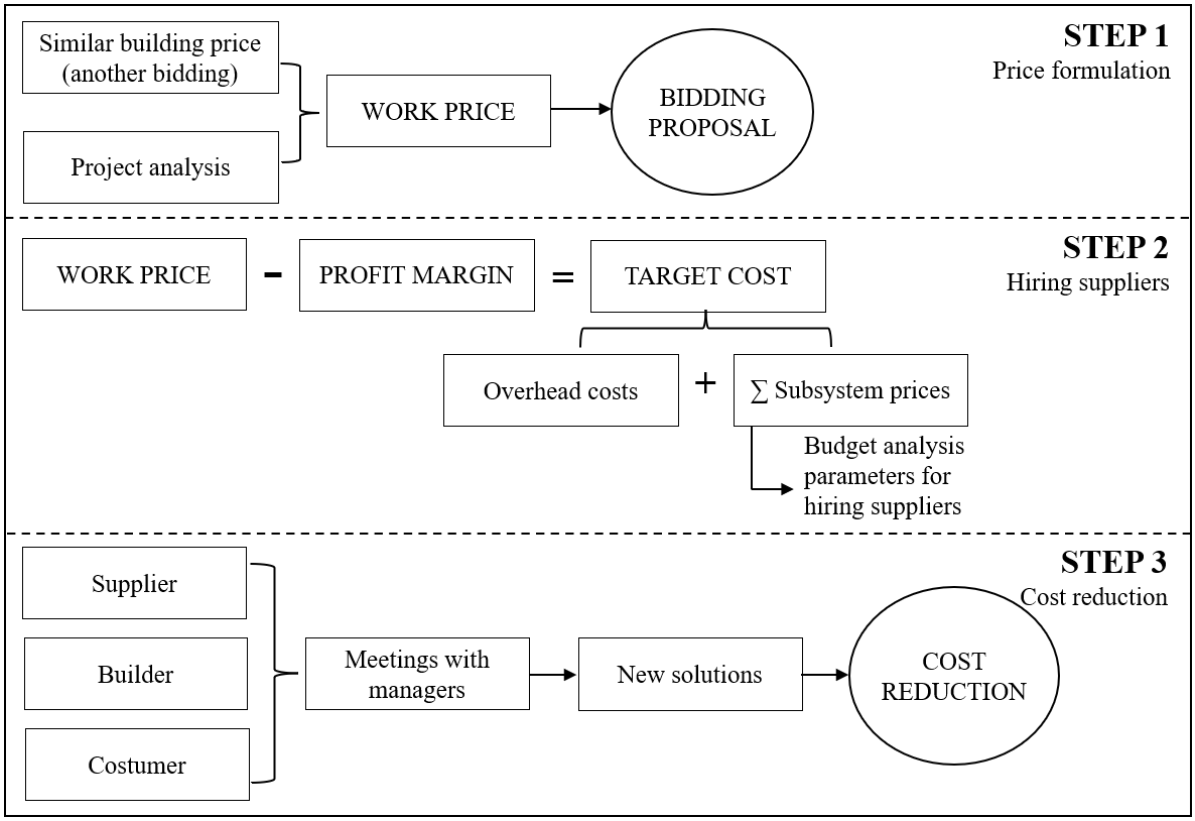

Figure 2. target costing model applied by a construction company
Source: Kern et al. (2006, p. 2396).

The second stage of the model (Hiring suppliers) presented by Kern et al. (2006) takes place if the company is successful in the bidding procedure. Under this premise, the target cost to be reached in the referred service provision is formulated, considering the indirect costs and the sum of the subsystem prices.

Romanova et al. (2017) point out that cost planning and management is effective when construction estimates and the maximum cost required by the client are considered, since in the target costing approach, the lower the cost the higher the profit for the entity without the loss and quality of the development occurring. In many cases this involves collaboration between suppliers, developers, contractors to find better organizational and design solutions for the mutual benefit of all participants in the construction process.

In this sense, the third stage of the aforementioned model (Cost Reduction) takes place. Kern et al. (2006) demonstrated that, as suppliers were hired, the company held meetings with engineers, contract managers, builders, and customers with the aim of reducing costs in product development. In the meetings, in addition to cost management, questions or new solutions found in the architectural design of the project were discussed.

The authors argue that the relationship between suppliers and builders is indispensable to the success of the enterprise. On this aspect, Jacomit (2010) explains that one of the steps to reduce costs is the determination and the involvement of all suppliers with the supply chain under the view of improving processes, reducing costs of components and products. Moreover, it is necessary the constant search for new production processes, materials and design solutions to achieve the development of the product or service.

In these discussions, it is worth noting that the policies developed in the public sector, which have construction services as their purpose, are usually thought by the price and economy of resources generated by a bidding process that chooses the most advantageous proposal for the Public Administration. In the view of Sobotka and Czarnigowska (2007), the basic question for the team that draws up public projects should not be how much the undertaking is likely to cost, but how much will be disbursed to achieve the goals for the citizen.

Thus, the target costing can favor cost control in construction companies, in addition to conditioning the preparation of competitive budget proposals without the enterprise losing quality and delivery of functional value to society. However, it is worth mentioning that the target costing model requires significant computational resources to meet the complexity of the underlying problems (Santana, Afonso, & Rocha, 2016) and a team with the participation of all agents involved and highly committed to the objectives set by the company, for the generation of ideas and analysis of alternatives related to costs (Guadanhim et al., 2011).

2.3 Previous Surveys

Previous studies have studied target costing applied to construction firms, citing Ballard and Reiser (2004), Kern et al. (2006), Formiga (2006), Sobotka and Czarnigowska (2007), Guadanhim et al. (2011), Pacheco (2015), Melo and Granja (2017), Potkány and Škultétyová (2019). The Table 1 shows these studies in terms of author/year, objective, and results.

Table 1. Previous surveys

Autoria/Ano	Objetivo	Resultados
Ballard and Reiser (2004)	Present a case study of target costing in a construction project, suggesting ways in which the industry can benefit from this costing methodology	It suggests that the adoption of target costing can have a beneficial impact on customers and suppliers, however more research is needed on the subject.
Kern et al. (2006)	Discuss the use of target costing as a cost planning technique in the early phase of construction projects.	From the signing of the service contracts, the estimated cost of the enterprise was reduced through the partnership relationship between the main suppliers and the company
Formiga (2006)	To present the results obtained with the implementation of target costing for budgeting in a construction company.	The use of target costing in the company was extremely satisfactory, positively influencing the contracting of new projects, as well as increasing the competitive advantage and reducing uncertainty by increasing information.
Sobotka and Czarnigowska (2007)	Analyze the potential application of target costing in the planning of public infrastructure projects.	The greatest potential for the use of meta costing occurs in public-private partnership arrangements, because the product sold by the contractor is not a

		building, but an infrastructure based service.
Guadanhim et al. (2011)	Analyze the applicability of target costing in the design stage of social housing developments.	Suggests that this context enables the application of target costing so that customer needs are better addressed. Proposes guidelines for improvements in the design process to enable the application of target costing in this context.
Pacheco (2015)	Propose actions for a construction company based on target costing to improve the production of social housing.	It was possible to analyze the extent of applicability of the principles of target costing in the construction company and to propose improvement actions for social housing, focusing on the design process and on the quality of execution.
Melo and Granja (2017)	Investigate whether the conceptual framework of target costing applies – with or without adjustments – to real estate developers.	Guidelines are proposed for introducing target costing into the residential real estate product development process. The guidelines are related to the three main sections of the target costing process: market-oriented costing, product-level costing, and component-level costing.
Potkány and Škultétyová (2019)	Present the results of research on the preferences of potential wood house customers for the use of the target costing method in the wood processing industry,	The results can be used as information for making decisions about the level of prices for purchase or production of individual components by the company itself.

Source: Prepared by the authors.

In these studies, the case study methodology prevails (75%) and the general results indicate that the application of target costing has a positive impact on companies in the construction sector, either directly or indirectly. This impact can be, for example, improvement in the cost management process, reduction of project costs, increase of information, and strengthening of the partnership with suppliers. Studies also suggest that the use of target costing has a positive influence on meeting project deadlines, increasing added value for customers, and maximizing the profitability of companies.

3. Methodological elements of the research

As for the research procedures, this is a single case study with a descriptive and qualitative approach, whose deductive method was adopted. The research was conducted in a small service company in the

construction industry, located in the city of Patu-RN. The choice of this company and its respective sector of activity occurred due to ease of access by researchers, being characterized as an intentional study by accessibility or convenience (Prodanov & Freitas, 2013). In addition, a literature search was conducted on the target costing in construction, in order to theoretically ground the study.

In April 2019, a questionnaire was prepared by the researchers (with seven closed questions) and applied to the company's accountant, whose content was intended to identify how the company controls its costs. No pre-test was conducted due to the simplicity of its questions. Then, in April and May, observations were made in the company's office and unstructured questions were asked to the manager and the financial director, in order to understand the budgeting process and the methods used to prepare the company's proposals to participate in public bids. The research also included a documentary study of the company's financial statements and spreadsheets of cost estimates and price formation based on the bidding documents of public entities.

As for the monitoring of the process of preparing the price proposal, items of the Tender Protocol No. 001/2019 of the City Hall of Campo Grande-RN were analyzed. This analysis was compared to the proposal prepared by the company, which used its empirical method to participate in a bid that would take place on April 1, 2019. The referred participation occurred through a public bid in the price taking modality (the lowest price type), under the object "hiring a specialized company for paving with surface drainage of streets".

The data was tabulated in a sample form, identifying the items of the call for bid in which the company had the possibility of reducing the costs of the main inputs of that item, using the good relationship with the supply chain (suppliers). It also analyzed the history of proposals submitted by its competitors in previous biddings with the same object of contract (cobblestone street paving service), presenting a competitive price proposal. A parallel was also used between the company's proposal and the maximum price the bidding entity proposed to pay, reporting the percentage reduction based on this methodology. Next, an analysis of the resulting data was performed, and a target costing model that favors the construction of competitive proposals and profitability for the company studied was elaborated.

Considering that an implementation of target costing in a company requires significant changes in terms of internal processes and management support, and that the company studied was not in satisfactory conditions in this regard, the study focused only on the preparation of a model proposal for the company to use as a reference. Therefore, there was no implementation and follow-up of this proposal.

4. Presentation and discussion of results

This section deals with the presentation and discussion of the research results regarding the case study in a small construction company, which are divided into four subsections: the questions, the observations and other questions, the documentary research, and the proposed target costing model.

4.1 Of the questions

The data survey, through the questionnaire applied to the Accountant, sought to identify initially if the company had an effective cost control in its activities, as shown in Table 2.

The data indicate that the company under study has cost control in the development of its construction activities, but does not use a specialized electronic system for this control. Therefore, it would be important to invest in a software to accurately measure costs in the production of services, especially if the company is to adopt the target costing methodology that requires significant computational resources, as emphasized by Santana et al. (2016). In addition, it would be essential to retain a specialized professional to assist the Accountant in cost control, because, as stated by Ahn, Clermont, and Schwetschke (2018), joint efforts of skilled people are necessary to achieve the desired costs. This could favor the manager's decision making, help improve competitiveness, and seek to achieve the desired profitability goals.

According to the research data, the entity uses the absorption costing method for cost appropriation, which aims to encompass all costs involved in the production of the product or in the provision of services, such as: fixed, variable, direct and indirect costs. However, as Lacerda and Rodrigues (2009) emphasize, the main problem with absorption costing lies in the fact that fixed costs are allocated to products or services by arbitrary apportionment criteria, which may cause distortion in decision making.

Table 2. Questions about cost control in the company

Question	Answer
Does the company use any cost control method?	Yes.
Does the company use any cost control software?	No.
Who performs cost control in the company?	Accountant.
What is the costing method used by the company?	Absorption costing.
How is cost control done?	Notes on paper and control sheets.
Is it difficult to classify and measure costs and expenses?	Yes.
What are the limitations of cost control in the company?	Inefficient or non-existent cost management system.

Source: Prepared by the authors (2019).

Also, according to the research, the company's cost control is done through manual notes on paper and spreadsheets, and there are difficulties in classifying and measuring costs and expenses, generating limitations in the control because the system is inefficient or non-existent. This is in accordance with the reports of Lima and Moraes (2016), when they say that the maintenance of small businesses in the competitive market is related to a series of limitations, among them, the difficulty in distinguishing expenses, costs and expenses, classifying and mapping them in an effective and objective manner.

Therefore, cost management done by means of paper notes and centralized in a single person may represent a fragile control and the provision of inaccurate information to stakeholders, especially to the administrator who has decision-making power. Thus, the values corresponding to profits or losses of a period or the figure for the execution of some contract may be wrong. Furthermore, analyzing the company's Profit and Loss Statements for 2017 and 2018, it was found that the costs of the services

provided are equivalent, on average, to 60% of its gross operating revenue. So, the possibility of the company investing in a cost control system and in the allocation of a professional for this purpose could decrease this average and consequently improve the company's results.

4.2 From observations and other questions

The second part of the case study included observations in the company and other unstructured questioning made to the manager and the financial/contracts director, to verify how the company's budgeting process (financial proposal) worked. In this sense, Formiga (2006) explains that the costing systems of construction companies are based on the traditional budgetcomposed of unit prices of services, indirect costs and profitmargin. However, by using only the budget as a basis for cost projections, the company is prone to lose competitiveness and profitability, and to incur possiblelosses.

Thus, based on the observations and other questionings, it was found that the process to define the proposal to participate in a bidding contest is elaborated byintuitively applying concepts of target costing according to the following steps:

a) search of the public notice *in loco*, verifying the price and project conditions. If the price is outside market standards or the project is old, the bidding is abandoned;
b) projects a proposal to participate in the bidding, basedon the price of the work, the acceptable profit marginminus expenses and taxes, as well as considering the history of previous proposals submitted by the bidders;
c) based on this, the proposal is analyzed by the engineer, the financial director and the administrator.Then, the administrator makes the decision based on the suggested price and conditions previously established (in the case analyzed, it was based on the Call for Bid No. 001/2019);
d) the negotiation with input suppliers occurs after the contract is signed. In this aspect, Guadanhim *et al*. (2011) consider the late action with suppliers an obstacle to the target costing. However, there is a partnership relationship between the company and suppliers that favors bargaining power. Relying on this, the company designs its proposal believing in the reduction of input costs. For example, a considerable discount of 60% has been achieved on a certain input.This partnership with suppliers for cost reduction is also reported by Kern *et al.* (2006);
e) in projects for the "Minha Casa Minha Vida" program and also in other non-bidding projects, the company relieson the involvement of its labor department to meet the project's execution schedule, delivering it ahead of schedule and with the value that the customer expected, since it was possible to make improvements in structural and functionality components. In the case of bidding works, this is not possible, because the project is prepared and delivered by the contractor (public agency), and the company can only work with the input suppliers.

Using this technique, the company was able to prepare competitive proposals that brought profitability to the entity. However, in some biddings the competitors tend to present a very low-price proposal, outside the acceptable market standard. This occurs because "the competitive environment, defined by the participation of construction companies, does not occur at the level of quality, but in public bids based on the lowest price" (Guadanhim et al., 2011). Because of this, the company under study was not the winner of these contests. If it had won, the prices charged in these competitions could result in

financial, legal and image losses for the entity for not being able to deliver the work.

Furthermore, the company tacitly and intuitively uses the concepts of target costing, such as the relationship with suppliers that favored the negotiation for the reduction of input costs, and the collaboration of the manager, labor, and other sectors to deliver the work on time. Moreover, the projection of the financial proposal of this company is very similar to the formula for calculating the target cost, but there is no concern with first defining the costs and working inversely to obtain the profit. This confirms the statement by Nicolini, Tomkins, Holti, Oldman and Smalley (2000), when they say that in construction companies many decisions are based on estimates and managers' tacit knowledge.

Although the company uses this methodology intuitively, it still lacks effective cost control, since the control and classification of costs and expenses is done by paper notes and manual calculations, not to mention that not all indirect costs and related expenses are taken into consideration when preparing proposals. In this perspective, Pacheco (2015) reports that the applicability of the target cost brings cumulative benefits to the company when it is inserted into the entity's culture. But it is necessary the occurrence of a series of factors that enhance the methods in the company, such as: cost control; collaborative work between the company's sectors; reliable data surveys and production efficiency.

4.3 Documentary research

The third part of the case study observed, in the company's practice, the preparation of a price proposal for participation in a bid that would take place on April 1, 2019, through a public tender, in the price taking modality and of the lowest price type. The object of the bid was to hire a specialized company for paving with surface drainage in the projected streets 01, 02, 03, 04, 05 and 06 in the community of Bom Jesus, rural area of the municipality of Campo Grande/RN, according to the transfer contract from Caixa Econômica Federal: CT: 1052371-41/2018, with an overall value of R$ 382,409.61.

Using the history of competitors' proposals, the company's bargaining power and the excellent relationship with the input suppliers, a team formed by the manager, engineer and financial director prepared a competitiveproposal for cobblestone paving under a cement grouted sand cushion, for the manager's decision. This methodologyis shown in a sample form in Table 3, which presents the values for item 145 of the price quotation.

Table 3. Methodology for preparing the company's competitive proposal

Composition of the service						
Contractor/customer			**Company proposal**			**Reduction**
Material	**Unit**	**Vr. R$**	**Material**	**Unit**	**Vr. R$**	
Fine sand	m^3	60,00	Fine sand	m^3	36,60	39,0%
Coarse sand	m^3	65,00	Coarse sand	m^3	42,70	34,3%
Portland cement	kg	0,43	Portland cement	kg	0,27	37,2%
Parallelepiped	un	0,40	Parallelepiped	un	0,30	25,0%
Total		**25,80**	**Total**		**18,07**	**30,0%**

Source: Prepared by the authors.

The data in Table 3 expose that the company managedto reduce by 30% the total cost with the acquisition of materials for the provision of the reported service. The company projected this reduction based on the relationshipwith its supply chain and by comparing its offer with the price history presented by competitors. But this practice is uncertain, since the desired percentage may or may not bereduced. Ideally, the negotiation should take place when the proposal is being prepared, working on the basis of the maximum allowable cost or target cost (Romanova *et al.*, 2017), since by achieving or reducing it, the company will obtain the desired profit, as well as a competitive price proposal. In addition, it is possible to reduce the risks inherent in meeting deadlines for the execution of the object.

As for the overall value of the proposal to participate in the tender under analysis, the company was able to submit the price of R$ 302,867.33, which corresponds to 79.20% of the total value that the Municipality of Campo Grande/RN made available for the tender (R$ 382,409.61). However, according to the result published on May 20, 2019, in the official newspaper of the Municipality, the proposal submitted by this company object of study was ranked 8th in a universe of 10 qualified companies. The winner was thecompany that submitted a proposal in the amount of R$ 258,441.90, which corresponds to 67.59% of the amount made available by the municipality for contracting.

Based on these analyses, the company participating inthis study was prudent in relation to the presentation of a price proposal with a good financial return. However, it is worth reflecting on the proposal of the company that won the bid in relation to the aspect of profitability, since it committed to do the work for a price 32.61% lower. Such anindex may lead to losses to the public entity, since the company might not deliver the bid object on time or with aquality that differs from the initial project. This would be contrary to the statements of Zimina et al. (2012) regardingthe benefits of target costing, such as the delivery of the project at a reduced cost without losing the contracted quality and deadline.

Then, it can be gauged that the methodology of the target cost, applied in a tacit and intuitive way in this company, may provide it with the preparation of proposals with a good financial return and able to meet the specifics of the work (project) and delivery time. On the other hand,considering that after the contracting process the companymust provide the services based on the price presented, poorly prepared proposals and without cost control basis may result in losses both for the company (financial) and forthe public service, with delays, stoppage or delivery of thework with inferior quality.

Based on these analyses and the theoretical framework, the next step is to discuss a target costing model for the company to use as a reference when preparing its price proposals for participation in public bidding processes. This model aims to guide those responsible for better planning of their costs and decision making regarding the participation in public bids.

4.4 The proposed target costing model

Based on the data collected and analyzed and, on the theory, presented by Ballard and Reiser (2004), Kern et al. (2006), Formiga (2006), Jacomit (2010), Zimina et al. (2012), and Romanova et al. (2017), a target costing model is proposed to assist in the cost measurement process and in the development of competitive proposals for the company under study, providing subsidies for decision making with a lower degree of risk.

In this proposed model, as shown in Figure 5, the process begins with the search for the public

notice through a search in the official press for publications of open bids, using an electronic tool (conlicitacao.com.br) that filters open bids close to the region where the company operates. Once the target is defined, the company goes to the location where the contracting process will take place, to verify the conditions to provide the service in relation to price, project, and deadline. If the price is below market rates or if the project is old and the services have been estimated based on the Sistema Nacional de Pesquisa de Custos e Índices da Construção Civil (SINAPI) table that is more than three years old, the bidding process is discontinued.

When the prices and conditions of the project are attractive to the company, the departments must meet and discuss the actions for participation in the bidding. In addition, available resources must be sought to start the work until the first measurement, since in public service the payments occur according to the execution foreseen in the disbursement schedule (physical-financial). In this first stage, the directors of finance, engineering, budgeting and administration must participate.

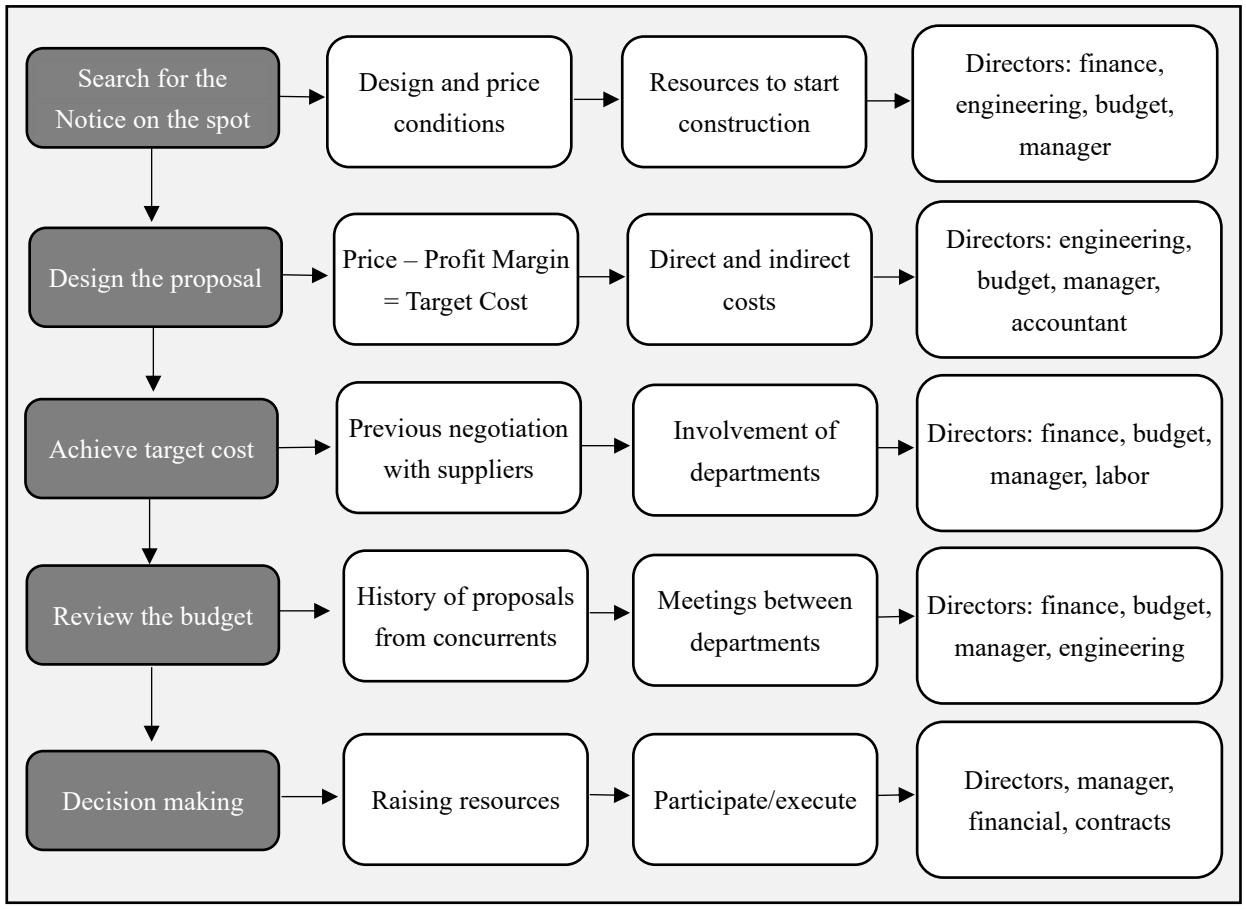

Figure 5. Proposed target costing model for the company
Source: Prepared by the authors.

In the second step, the proposal should be designed starting from the price of the bid minus the expected profit margin, obtaining the maximum target cost that the company should work. It should be noted that the price available for contracting is maintained, so the lower the target cost, the higher the company's profit margin will be (Romanova et al., 2017). In addition, it is recommended that the entity implement a cost system with a qualified professional and a system that can measure all direct or indirect

costs related to the provision of services. The directors of engineering, budgeting, administration and the accountant should participate in this step, in addition to the professional qualified to control costs.

In the third step of the proposed model, it is explained how the company should reach the previously defined target cost or reduce it in order to present a competitive proposal with a considerable profit margin. To this end, negotiations must begin with the supply chain, concomitant with the preparation of the proposal, proposing the reduction of the main inputs related to the work, in addition to the involvement of the company's labor department under the possibility of executing the service on time and reducing the production process. The financial, budget, administrative, and labor directors must participate in this stage.

Then, in the fourth step, the budget must be reviewed by comparing the price suggested for participation in the bidding with the history of proposals from competing bidders. At this point, an organized and updated database of the participants' financial proposals is maintained. Under this aspect, one must consider the bids that the companies presented proposals with the object of a similar contract. Moreover, before the decision is made, the company's manager and directors meet under the premise of reviewing the budget proposal, discussing deadlines and values required for the execution of the work. The budget planner must have a database with updated information about the bidders' proposals; if there are new bidders, the manager must be alerted about the decision to be taken. The financial, budget, administrative and engineering directors must participate in this stage.

In the fifth and last stage, the company must decide whether or not to participate in the bidding, under the premise of having at least the resources available for the execution referring to the first installment of the services foreseen in the physical-financial schedule.

Finally, it is important to report that this study focused only on the development of a proposal of a target costing model for the company to use as a reference in bidding processes, since at the time of the research the company was not in favorable conditions to implement the referred model. These conditions are related mainly to the need for a change in the human resources' posture for the implementation of the method, but also with regard to the need to adapt internal processes and financial investment to hire personnel and purchase specific hardware and software for this purpose. A similar aspect is reported by Guadanhim et al. (2011), when they say that "it is necessary to recognize that construction companies, with rare exceptions, do not have full control of costs and adequate structure to apply the recommended strategy."

On the other hand, it was found that the development of the research provoked moments of reflection in the company's manager and directors, who became aware that they need to change their posture concerning the evaluation and control of costs in general. Because of this, the manager proved to be very receptive to the future implementation of target costing, which is why the researchers were available for guidance and clarification of any doubts.

5. Conclusion

The implementation of cost control tools in companies of the construction segment, such as the target costing, represents the possibility of a more efficient cost management, since it helps in the exclusion of flaws in the production process and in the reduction or elimination of waste of materials, time, and labor.

This can favor the competitiveness desired by these companies, contributing to the prevention of premature mortality and their permanence in the market. Therefore, the objective of this study was to propose a target costing model for a small construction company, in order to contribute to the efficient evaluation of its costs for the maximization of profits in proposals to provide services to public entities. The methodology used was a case study with a descriptive approach, whose research instruments were the questionnaire and observation.

Based on the study of the company's budget proposal preparation process, it was verified that the company empirically uses the concepts of target costing, such as the supply chain analysis and the analysis of competitors' previous proposals. However, it was found that the budget proposal model used by the company until then needed improvement in terms of cost evaluation to achieve better profitability, which is why some adjustments were proposed and presented in the target costing model directed to the company under study. Then, to minimize risks, it was recommended that managers seek to use the proposed model as a reference, since it is an adequacy of the routines developed in the process of preparing financial proposals.

However, it was found that the company was not in favorable conditions to implement the mentioned costing target model. These conditions are mainly related to the need for a change in the human resources' attitude to implement the method, but also with regard to the need to adapt internal processes and financial investment to hire personnel and purchase specific hardware and software for this purpose. On the other hand, the company's management proved to be very receptive to the future implementation of the target costing methodology for cost evaluation and control.

Regarding the contributions to the literature, the study's discussions help to better understand the nuances of the target costing methodology in small companies of the construction sector, including proposing a base model for this business segment. On the other hand, the results show that conservative management methods and decision-making processes performed in a tacit and intuitive manner is a reality in small companies in this sector, especially with regard to cost management. Finally, it was observed that the development of the research in the company provoked moments of reflection in the manager and directors, who became aware that they need to change their posture regarding the evaluation and control of costs in general.

The study's main limitation concerns the lack of application and follow-up of the proposed target costing model, given the company's unfavorable conditions. The reduced number of questions in the research instrument is also a limiting factor, since it could have explored more about the company's cost analysis and control routines. Another limitation is related to the fact that this was a single case study, since increasing the number of companies, and chosen at random, could positively impact the research results.

Finally, future studies could investigate which is the most efficient method of cost control in the preparation of a competitive financial proposal by small construction companies. They could also study what is the profile of construction companies that succeed in competing for public bids. In addition, a comparative study should be done on the profitability of small companies before and after the implementation of a target costing model.

6. Acknowledgement

The research was supported by University of Estado do Rio Grande do Norte (UERN), Brazil.

7. References

Ahn, H., Clermont, M., & Schwetschke, S. (2018). Research on target costing: past, present and future. *Management Review Quarterly*, *68*(3), 321-354. Retrieved 17 May, 2020, from https://doi-org.ez101.periodicos.capes.gov.br/10.1007/s11301-018-0141-y

Ballard, G. & Reiser, P. (2004, janeiro). The St. Olaf college fieldhouse project: a case study in designing to target cost. *Proceedings of the Annual Conference of the International Group for Lean Construction*, Helsignor, Denmark, 12. Retrieved 9 November, 2019, from https://www.researchgate.net/publication/240623009_The_St_Olaf_College_Fieldhouse_Project_A_Case_Study_in_Designing_to_Target_Cost

Bomfim, T. F. S., Santos, D. P. G., & Santos, D. P. G. (2017, novembro). Gestão de custos nas micro e pequenas empresas: uma análise nas organizações do ramo de construção civil no município de Camaçari-BA. *Anais do Congresso Brasileiro de* Custos, Florianópolis, SC, Brasil, 24. Recuperado em 9 novembro, 2019, de https://anaiscbc.emnuvens.com.br/anais/article/view/4363

Costa, W. J. V., Gonçalves, R. J., Silva, K. P. G., & Teixeira, D. G. (2014, outubro). Processos produtivos na construção civil: otimização do processo de reboco de fachada em edificação. *Anais do Encontro Nacional de Engenharia de Produção*, Curitiba, PR, 14. Recuperado em 16 março, 2020, de http://www.abepro.org.br/biblioteca/enegep2014_TN_STO_195_101_25756.pdf

Feil, P., Yook, K. H., & Kim, I. W. (2004). Japanese target costing: a historical perspective. *International Journal of Strategic Cost Management*, 11, 10-19. Retrieved 13 May, 2020, from https://uakron.edu/cba/docs/ins-cen/igb/scm/TCHistory_formatted.pdf

Formiga, A. S. (2006). *Implantação do uso do target costing na elaboração de orçamento de obras em empresas de construção civil de Porto Alegre/RS*. Dissertação de Mestrado, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brasil. Recuperado em 9 novembro, 2019, de https://www.lume.ufrgs.br/bitstream/handle/10183/10148/000522468.pdf?sequence=1

Guadanhim, S. J, Hirota, E. H., & Leal, J. G. (2011). Análise da aplicabilidade do custeio-meta na etapa de concepção de empreendimentos habitacionais de interesse social. *Ambiente Construído*, *11*(2), 39-56. Recuperado em 25 maio, 2020, de https://dx.doi.org/10.1590/S1678-86212011000200004

Jacomit, A. M (2010). *Modelo para incorporação do custeio-meta ao processo de desenvolvimento de produtos em edificações*. Dissertação de Mestrado, Universidade Estadual de Campinas, Campinas, SP, Brasil. Retrieved 9 novembro, 2019, de http://taurus.unicamp.br/bitstream/REPOSIP/257836/1/Jacomit_AnaMitsuko_M.pdf

Kern, A. P., Soares, A. C., & Formoso, C. T. (2006, agosto). O custo meta no planejamento e controle de custos de empreendimentos de construção. *Anais do Encontro Nacional de Tecnologia no Ambiente Construído*, Florianópolis, SC, 11. Recuperado em 22 novembro, 2019, de http://www.infohab.org.br/entac2014/2006/artigos/ENTAC2006_2391_2400.pdf

Kron, C., & von der Haar, R. (2016, July). Target costing for the development of office buildings.

Proceedings of the Annual Conference of the International Group for Lean Construction, Boston, USA, 24. Recuperado em 17 maio, 2019, de https://pdfs.semanticscholar.org/13a0/3768c4c9ad51ce2d34df2ccee48381a70d0a.pdf

Lacerda, D. P. & Rodrigues, L. H. (2009). Uma discussão sobre o mundo dos custos e o mundo dos ganhos sob o ponto de vista da teoria das restrições. *Revista Eletrônica Sistemas & Gestão, 4*(1), 36-54. Recuperado em 19 novembro, 2019, de http://www.revistasg.uff.br/index.php/sg/article/view/V4N1A3

Lei n. 8.666, de 21 de junho de 1993 (1993). Regulamenta o artigo 37, inciso XXI, da Constituição Federal, institui normas para licitações e contratos da Administração Pública e dá outras providências. Diário Oficial da República Federativa do Brasil, Brasília, DF: Poder Executivo.

Lima, F. F. & Moraes, R. A., Filho (2016). Gestão estratégica de custos: custeio por absorção em pequenas empresas em Recife, PE, Brasil. *Revista Interações*, *17*(3), 528-541. Recuperado em 5 novembro, 2019, de http://www.interacoes.ucdb.br/article/view/664/pdf

Melo, R. S. S., & Granja, A. D. (2017). Guidelines for target costing adoption in the development of products for the residential real estate market. *Ambiente Construído*, *17*(3), 153-165. Retrieved 22 May, 2020, from https://doi.org/10.1590/s1678-86212017000300168

Mollo, R. (2015). O que leva uma empresa a fechar – e como evitar isso. **Exame**. Recuperado em 17 março, 2020, de https://exame.abril.com.br/pme/o-que-leva-uma-empresa-a-fechar-e-como-evitar-isso/

Morais, M., Granja, A. D., & Ruschel, R. C. (2015). Restrições orçamentárias e entrega de valor: sinergias entre BIM e custeio-meta. *Gestão & Tecnologia de Projetos*, *10*(1), 7-27. Recuperado em 20 março, 2019, de http://www.revistas.usp.br/gestaodeprojetos/article/view/81141/105978

Nicolini, D., Tomkins, C., Holti, R., Oldman, A., & Smalley, M. (2000). Can target costing and whole life costing be applied in the construction industry? Evidence from two case studies. British Journal of Management, London, v. 11, n. 4, p. 303-324. Retrieved 25 May, 2020, from https://doi-org.ez101.periodicos.capes.gov.br/10.1111/1467-8551.00175

Ofileanu, D. (2015). Target costing funtions. *Revista Economica*, Sibiu, Romênia, *67*(5), 90-103. Retrieved 17 March, 2019, from http://economice.ulbsibiu.ro/revista.economica/archive/67508ofileanu.pdf

Pacheco, M. F. (2015). *Proposições de ações baseadas no custeio-meta para melhoria das habitações de interesse social*: enfoque no valor para o cliente. Dissertação de Mestrado, Universidade Federal de Goiás, Goiana, GO, Brasil. Recuperado em 9 novembro, 2019, de https://repositorio.bc.ufg.br/tede/handle/tede/5267#preview-link0

Potkány, M., & Škultétyová, M. (2019). Research into customer preferences of potential buyers of simple wood-based houses for the purpose of using the target costing, *Open Engineering, 9*(1), 390-396. Retrieved 16 May, 2019, from https://doi.org/10.1515/eng-2019-0048

Prodanov, C. C., & Freitas, E. C. de. (2013). *Metodologia do trabalho científico: métodos e técnicas da pesquisa e do trabalho acadêmico* (2a ed.). Novo Amburgo: Freevale. Recuperado em 25 maio, 2020, de http://www.feevale.br/Comum/midias/8807f05a-14d0-4d5b-b1ad-1538f3aef538/E-book Metodologia do Trabalho Cientifico.pdf

Ribeiro, M. A. (2003). Custo meta: uma solução para a falta de custeio dos produtos nas micro e pequenas empresas. *Revista Mineira de Contabilidade*, *12*(4), MG. Recuperado em 22 novembro, 2019, de http://revista.crcmg.org.br/index.php?journal=rmc&page=article&op=view&path%5B%5D=483&path%5B%5D=287

Romanova, S. V., Popova, T. D., Slatvitskaya, I. I., & Mironova, D. D. (2017). Application of target costing in social infrastructure construction projects. *Revista Espacios*. Caracas, Venezuela, *38*(33), 37-46. Retrieved 18 March, 2019, from https://www.revistaespacios.com/a17v38n33/a17v38n33p37.pdf

Sanches, D. M. N., Silva, G. F., Sanches, V. L., Melo, A. F., & Matos, S. (2018). A importância da gestão estratégica de custos para a tomada de decisão. *Revista Científica Multidisciplinar Núcleo do Conhecimento*, *6*(2), 186-207. Recuperado em 18 março, 2019, de https://www.nucleodoconhecimento.com.br/administracao/gestao-estrategica-de-custos

Santana, A., Afonso, P., & Rocha, A. M. (2016). A prescriptive cost model for demand shaping: an application for target costing. *Proceedings of the International Conference on Project Evaluation*, 3, 9-16. Retrieved 13 de May, 2020, from https://repositorium.sdum.uminho.pt/bitstream/1822/50139/1/A%20prescriptive%20cost%20model%20for%20demand%20shaping%20an%20application%20for%20target%20costing.pdf

Serviço Brasileiro de Apoio às Micro e Pequenas Empresas de São Paulo (SEBRAE-SP). (2014). *Causa Mortis*: o sucesso e o fracasso das empresas nos primeiros 5 anos de vida. São Paulo. Recuperado em 13 fevereiro, 2019, de https://bibliotecas.sebrae.com.br/chronus/ARQUIVOS_CHRONUS/bds/bds.nsf/333000e30d218194165cd787496e57f9/$File/5712.pdf

Serviço Brasileiro de Apoio às Micro e Pequenas Empresas (SEBRAE). (2016). *Sobrevivência das empresas no Brasil*. Brasília. Recuperado em 17 março, 2019, de https://m.sebrae.com.br/Sebrae/Portal%20Sebrae/Anexos/sobrevivencia-das-empresas-no-brasil-102016.pdf

Sobotka, A., & Czarnigowska, A. (2007). Target costing in public construction projects. *Proceedings of the International Conference on Modern Building Materials, Structures and Techniques*, Vilnius, Lithuania, 9. Retrieved 8 January, 2019, from https://www.researchgate.net/publication/265924943_TARGET_COSTING_IN_PUBLIC_CONSTRUCTION_PROJECTS

Zimina, D., Ballard, G., & Pasquire, C. (2012). Target value design: using collaboration and a lean approach to reduce construction cost. *Journal Construction Management and Economics*, *30*(5), 383-398. Retrieved 5 Dicember, 2019, from https://doi.org/10.1080/01446193.2012.676658