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Research Paper

Designing a Strategic Model for Pricing Industrial Products with an Approach Activity-Based Costing Based on the Data Theorizing Method of the Foundation

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Abstract **Today, one of the most important concerns of organizations is to face changing environments in valuing their products. Therefore, manufacturers show different behaviors in the face of uncertainty about the future price of their products. Therefore, in the present study, the researcher, using the data theorizing method of the Foundation, seeks to provide a strategic pricing model for industrial products with the FABC approach. Based on theoretical sampling and snowball sampling method, after collecting data through in-depth and semi-structured interviews with 16 university experts and steel industry experts, the text of the interviews was initially coded and extracted. Concepts of designing and explaining the strategic pricing model of products in industrial tools were analyzed by research data and categories. Findings show that considering the causal, contextual and intervening factors affecting the pricing of industrial products with a fuzzy activity based costing approach, the adoption of proposed strategies in the resulting model leads to increased productivity and power Competitive manufacturing companies.**

Keywords *Pricing, Industrial Products, Costing Approach, Foundation Data Theorizing Method*

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Introduction

Pricing is one of the topics that has been considered by researchers in recent years. Pricing is defined as a very important tool in profit maximization, regardless of the fact that this tool is also used in supply chain management, demand regulation and production and distribution (Prasad, 2014). Price has a different and multiple role in industrial markets, and paying attention to each of them is of great importance and neglect causes it to set unreasonable and inappropriate prices for products. Therefore, according to the developments that have taken place in different markets and industries, and because other traditional accounting-based methods alone are not able to respond to effective and efficient pricing. Also, given the important point that accounting information cannot be ignored in product pricing, it is necessary to provide a strategic model of pricing of industrial products that consider a combination of different elements and factors in the areas of demand, competition, cost, etc. Because efficient and effective pricing requires that appropriate accounting, market, as well as competitor information be collected and processed. In addition, you must have information and awareness against price changes. At the same time, transparency of company management goals and awareness of government policies and regulations are essential and unless a combination of factors is considered, decisions will be incomplete and inefficient (Carvalho, 2016). In the iron and steel industry due to the volume of production and advanced production technology, the nature of the products of this industry is strategic and infrastructural and the importance of increasing development and variety of products and the very large share of overhead costs in the cost of products on the one hand and the importance of accessing accurate, accurate, relevant and timely information in optimizing decisions regarding progress and development and even effective pricing of products, cost control, profitability analysis, each type of production, increasing factory profit margin, etc. On the other hand, the need to use the FABC system in calculating the cost of manufactured products, especially in the iron and steel industry, shows.

Therefore, the present study aims to provide a strategic model for pricing industrial products with an activity-based costing approach. In this way, the country's industries, especially those like the mother industries, can be used the iron and steel industry, which, despite their profound effect on various sectors of industry and domestic and foreign trade, always help with economic policies and pricing affected by the politicization of the economy.

Background

In today's business environment, more than ever, the only thing that remains constant is the phenomenon of change. The strategic management process basically believes that organizations need to constantly monitor internal and external events and processes in order to be able to adapt to change at the right time and as needed. One of the concerns of organizations is to face changing environments in valuing their products (Prasad, 2014). When manufacturers face uncertainty about the future price of their products, they behave differently. Therefore, in economic issues, especially microeconomics, pricing is one of the main activities. Because the lack of proper pricing to bring the product to market, as well as the lack of a proper pricing guide, has led many companies to market goods or technologies that do not match the market price (Kaufman, 2013). Price is the most flexible element of a marketing strategy, while pricing decisions can be implemented relatively quickly than other elements of a marketing strategy. However, one of the most difficult activities in the field of product marketing is evaluation and pricing. However, the prices of goods and services in different markets are determined based on price theory. But these prices set in all markets are not necessarily prices that are economically viable, in other words, provide the maximum benefit to society. Therefore, determining the optimal price or pricing issue in these markets is raised. Pricing means setting the price for a good or service (Cutler, 2008). Pricing is an activity that needs to be repeated and is an ongoing process. This continuity is due to environmental

changes and instability of market conditions, which creates the need for price adjustment (Shafei, 2014). Pricing is also one of the most important elements of a marketing mix, because it is the only element of the marketing mix that generates turnover for the organization, while the other three elements of the marketing mix are the variable cost of the organization; in other words, the product (it costs to design and produce products); Location (costs to distribute products) and promotion (costs to promote products) and only the price that it should support other elements of the marketing mix. (Behzad Far, 2018). Pricing decisions for industrial products are the core of any business plan and it will have a direct effect on the company's marketing strategy. All organizations, whether for-profit or non-profit, have to set prices for their goods or services, which is influenced by internal or external factors of the company. Factors of the company's internal environment include goals, policies, combination of marketing elements and costs of the company, and environmental factors include the nature of the market and demand, competitive conditions and intermediaries. Therefore, today, the proper development of product pricing strategy is a difficult and at the same time fundamental task for managers of industrial companies and failure to fully understand the right product pricing decisions will lead to the loss of profitable market opportunities. Because pricing is a multidimensional process that is affected by the product, the level of profit margins and customer relations (Strauss, 2012). The characteristic of industrial products (intermediaries) is that they do not reach the final consumption of consumers, but are in the process of producing other products. In fact, the customers of industrial products are not the final consumers, but the institutions and organizations that they buy industrial products for their commercial, manufacturing and organizational activities. This very important feature (non-final consumption) makes industrial products have a very different nature from consumer products and, consequently, these two products have different markets. The main difference between the consumer goods market and industrial products lies in the buying motives, and these differences

because the structure of these two markets to be completely different from each other. The motivation to buy for industrial products is to use them in the production process and to carry out other commercial activities. While the motivation to buy for consumer products is the final and personal consumption of products by consumers. In addition, due to the fundamental differences between industrial and consumer markets, marketing activities and operations in these two markets are different and each of them has its own methods and patterns (Wendell, 2016). Therefore, pricing decisions are influenced by internal factors (such as cost items, expected profit and expected sales, type of products or services, type of industry, reputation or credibility of the business unit) and external factors (such as the products or activities of commercial competitors, government policy, government policies, inflation rates, general trends in the economy, etc.) are: among these factors, many experts believe that costs, customers and competitors usually have the greatest effect on price, and pricing decisions are made by creating a balance between these factors (Cortic, 2007). In general, in industrial markets, companies face several important factors in determining or changing the price of their products that any pricing without considering them can be unrealistic and misleading and in some cases even to the detriment of companies. The following are some of the most important factors in Table 1.

Table 1
Factors Affecting the Pricing of Industrial Products

Row	Influencing factors	Description
1	Product value for the consumer	The value expected by the customer is considered a ceiling for determining the price of the product. The organizational buyer can use methods such as economic value, exchange value, and relative value to determine the appropriateness of the product price.
2	Cost considerations	Pricing without cost is meaningless and can lead to a big mistake. On the other hand, pricing based solely on cost is not very helpful.

Row	Influencing factors	Description
3	Competition	Among the factors influencing the pricing of industrial products, competition is the most important factor. Because if prices can compete, products will be sold.
4	Technological factors in the industry	Each market unit has a goal and plans to use equipment based on the latest technology in the world that will affect the cost.
5	Company's goals of pricing	Companies usually price their products in industrial markets to achieve goals such as pricing to achieve the desired return; Pricing to stabilize the price or profit margin; Pricing for market share; Competitive pricing; And pricing are related to product differences.
6	Top company management	Price decisions are often influenced by the preferences, tastes and expectations of top corporate management.
7	Government policies, laws and regulations	The government can have a significant impact on managers' pricing practices at all levels. The issue of government influence in the pricing of products is very complex and widespread. For example, direct and indirect taxes; Approval of various laws and regulations (price control and monitoring); Direct involvement in the sale of strategic materials such as copper, aluminum, steel, etc; Grammatical pricing.

Source: Taken from slavery and engraving (2019)

In general, the purpose of creating a costing system based on fuzzy activity is to develop a methodology for estimating parameters based on fuzzy sets. Because it is able to combine knowledge related to inherently vague and inaccurate information with the enamel costing system of the activity. In fact, a fuzzy activity-based costing system makes it possible for the user of the system, by gaining knowledge about the existing ambiguities and instabilities, to be able to combine the resulting knowledge with the production and decision-making process. Therefore, this system is suitable for companies that first: Operate in unstable environments; Second: accurate and sufficient information does not cost; Third: they are not sure about the accuracy of their cost estimates. In such cases, the use of fuzzy activity based costing system (FABC) has potential benefits such as: A) Provide additional information on the use of the

system in order to decide on production costs; B) empowering the user of the system by providing information related to the errors and ambiguities inherent in the system; C) Performing activity-based costing system sensitivity analysis by creating a good state. (Yeganeh et al., 2012). Despite the vital role of goods and services prices as an important variable in creating a competitive advantage in today's dynamic, volatile and competitive markets, so far, little research has been done on pricing policies and strategies, especially with a strategic approach that addresses both marketing and financial aspects. The following is a brief description of some previous foreign and domestic research in Table 2.

Table 2
Research Background

	Researcher	Research achievements
1	Carvaloo (2016)	If the products of one sector are used as inputs during the production of other sectors, even assuming complete price flexibility in one segment, macro-shocks can still have a detrimental effect on retail prices due to interaction between segments.
2	Pizini (2014)	Managers' evaluation of the usefulness of cost information has a positive relationship with the amount of cost information provided in detail, better classification of costs based on behavior, and continuous reporting of cost information. They provide four detail level features; Ability to provide details of cost behavior; Frequency of information collected and reports of deviations.
3	Astuti (2014)	By studying marketing elements, P7 (Product, price, promotion, location, people, physical evidence and consumer decision-making process in determining appropriate marketing strategies, price variables and pricing strategies)was identified as the most effective variable in increasing customers' purchasing decision.
4	Paspit (2013)	In a study on small and medium-sized industrial companies in Indonesia, they presented their marketing and development strategies by examining the internal and external environment and analyzing them. Accordingly, companies should use product development strategies and market penetration, depending on the industries in which they operate.

	Researcher	Research achievements
5	Bahrami (2019)	The extent of government price interventions is along the commodity value chain that In many of these cases, these interventions have created an imbalance in the profits of different links in the commodity value chain. Another important point about pricing regulations is the focus on price suppression, as opposed to trying to implement cost-cutting programs.
6	Pir malek (2018)	In reviewing the pricing strategies of saffron with the approach of analyzing strategic factors, they proposed strategies for creating a domestic regional stock exchange system and long-term price control in export markets according to the pricing and fair purchasing system.
7	Ostadi (2018)	Activity-based costing with fuzzy approach, by providing uncertainty in cost parameters, provides a more accurate estimate of the cost of activities, under conditions of uncertainty and allows costs to be calculated more accurately.
8	Ghanbari (2017)	Activity-based costing can assist management in improving the organization's information systems, cost management, re-engineering the organization and processes, operating budgeting, evaluating the organization's performance, and manpower.

Method

The method considered for conducting the present study is based on the qualitative method and basic research strategy. Foundation data theory is an inductive and exploratory research method that it allows researchers in various subject areas to formulate a theory instead of relying on existing and predefined theories (Strauss and Corbin, 2011). The design used in this study is based on the systematic design presented by Strauss and Corbin in 1990. The statistical population of the qualitative part of this research consists of managers, deputies, senior steel industry experts and academic experts (interviewees). In addition, people with knowledge of business management, industrial management and financial management who can have different experiences and different attitudes on the subject of pricing. Like university professors who specialize in education and research in the field of pricing, they are also studied in the statistical community. In this research, theoretical sampling and snowball sampling methods have been used. Snowball sampling is an unlikely sampling

method for situations where the units under study are not easily identifiable. Or it is not possible to have direct access to all the people needed in an organization. Also, in the theoretical method, after selecting the prototype, the researcher analyzes the data and then again selects more samples to refine his emerging categories and theories. This process continues until the researcher reaches the stage of data saturation; That is, to the point where no new predictions or data are obtained from the further expansion of the samples. In this study, 16 researchers observed signs of theoretical saturation from the interviews, but in order to ensure data adequacy, they increased their interviews to 18 cases. The following is a table showing the faces of the interviewees.

Table 3
The Appearance of the Participants in the Interviews

Number of interviews	**Composition of experts(How to communicate with industry)**	**Education**	**Average activity history**
18 people	9 university faculty members	Ph.D	17 years
	5 executives and board members of steel companies	Master - PhD	15 years
	4 steel industry activists and experts	Master - PhD	22 years

In this research, the library study method including the use of books, articles and the World Wide Web to collect information on the theoretical foundations of research and studies related to the research topic, and also, field methods including questionnaires, interviews and observations have been used to provide information for qualitative and quantitative analysis of data. Accordingly, in order to collect data in the qualitative part of the research, the in-depth and semi-structured interview technique was used, and since the interview method was in-depth and semi-structured, in conducting the interviews, an attempt was made to establish the existing facts by asking questions from research-related events. Thus, in order to achieve different dimensions of the research model, questions were

defined based on the six sections of data-driven theory and were asked between interviews to supplement the data. At the end of each session, the interviewees were asked to add whatever else they had to say. In this research, information from various library sources and participants who are among the senior executives of the steel industry has been used. In addition, during the process of data analysis and collection, which is done simultaneously in a data foundation research, the elites of the academic elite in the field of business, industrial and financial management were also taken to confirm the accuracy of coding and class formation. Also, in order to assess the reliability of the present study, some sections of the designed questions were modified by conducting an interview as a pre-test. Thus, after conducting any research and preparing the text of the interview from the recorded file, we reviewed and corrected some questions and in the next interview, the results of the change were applied.

Findings

In the qualitative part of this research, qualitative data analysis is performed using the foundation data theory. In data theory, the foundation uses a detailed and specific procedure for analysis and the procedure for compiling information classes (open coding), linking these classes (axial coding), and presents a story that connects these classes (selective coding) and at the end, presents a set of theoretical propositions (Faizi, 2015). Accordingly, to draw the final paradigm, we use the following categories:

- Core category: the mental image of the point that is the basis of the process;
- Causal conditions: includes those categories that affect the core category;
- Context conditions: requirements or underlying factors that affect the implementation of strategies;
- Intervening Conditions: general conditions from which strategies are affected;

- Strategies: actions or interactions that arise from the main phenomenon;
- Consequences: Express the results and consequences that result from the adoption of strategies (Creswell, 2005).

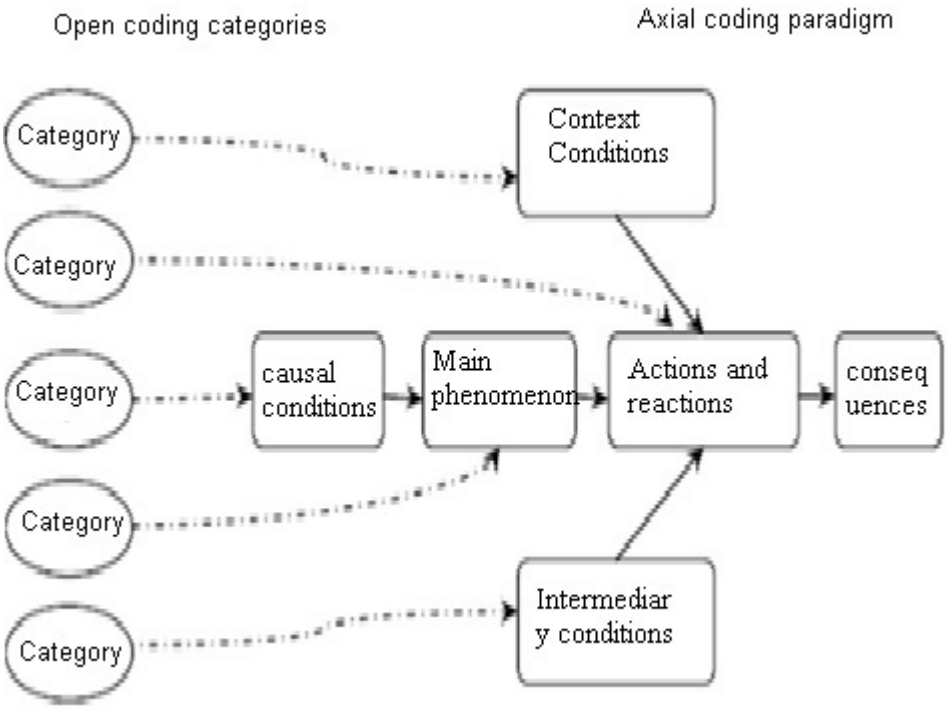

Figure 1
Stages of Systematic Design of Sstrauss and Corbin's Data Theory (Cresswell, 2005)

Qualitative data analysis in data research is based on a kind of continuous comparison method for data creation and analysis (Danaeifard, 2010). After compiling the research questions, the required data are collected and coded. The process of data analysis in theory-based growth theory reaches the stage of open coding (creation of concepts and categories); Axial coding ¬ (identification of the main category, causal

conditions, interventionist conditions, contextual conditions, strategies and consequences) and selective coding (theory creation) (Ali Ahmadi, 2018). Accordingly, in this part of the research, after collecting qualitative data in the process of in-depth interviews with experts, the mentioned interviews were studied and examined. Thus, the data were analyzed in three stages of open, axial and selective coding. In the open coding stage, first related concepts were extracted and after the process of comparing their similarities and differences, categories also emerged from a combination of similar concepts. Following the inductive process of research, in axial coding by examining the relationships between different categories, theorems (concepts) were formed. Finally, the selective coding stage, the concepts obtained from the previous stages, are categorized and presented in the form of a research model (Danaeifard, 2010). At this stage, each interview is considered as a comparison group. Thus, the first 18 interviews were studied line by line and from each interview, sentences that directly or indirectly referred to the factors influencing the pricing of products in the steel industry, selecting and extracting their concepts, the first open coding cycle was performed. The researcher then, in order to answer the question of in what cases these categories are similar to each other, compared the similarities and differences of the extracted categories and classified the similar categories in one category. Thus analyzing the data in this step in three steps A) Determining verbal evidence; B) Identification of components c) Identification of categories was done. The following is an open coding process with sample interviews for each category. In this study, after collecting data through 18 semi-open interviews with academic experts and steel industry experts, initial coding of interview text and extraction of design concepts and explanation of product pricing pattern in industrial tools, analysis of research data and categories were performed. A total of 95 initial codes were identified in terms of repetitions from the text of the interviews (open coding). In the next step, related concepts were identified and classified into 6 categories (axial coding). In data-based theorizing, after open coding, the concepts

derived from the initial coding are categorized and the relationship between them is attempted. The result of this classification and microscopic comparison of concepts with each other is the emergence of categories. In the following, we will focus on the concepts derived from the previous step (open source).

Table 4

Categories and Concepts Related to Causal Conditions

Open source (concepts)	Categories	Dimensions
Strategic capabilities	Technical and engineering capabilities	Causal conditions
Tactical capabilities		
Depth of technical knowledge		
Infrastructure development		
Development of communication channels with suppliers and distributors		
Investing in a value chain		

Table 5

Categories and concepts related to contextual conditions

Open source (concepts)	Categories	Dimensions
Accounting systems	Internal structures and systems	context conditions
Management information systems		
Human resource information systems		
Marketing and sales information systems		
Internal control systems		
Contradiction between agreeable policies	Government policies and interventions in industry	
Competitiveness and industry		
Economic policies		

Table 6

Categories and Concepts Related to Intervening Conditions

Open source (concepts)	Categories	Dimensions
Domestic policies	Political-economic factors	Interfering conditions
Political and diplomatic relations of the country		
Global political developments		
currency flactuations		
Balance of supply and demand		
Capability of industry-related industries		
Internal inflation rate		

Table 7

Categories and Concepts Related to Strategies

Open source (concepts)	Categories	Dimensions
Calculate the cost of main and by-products	Cost calculation with fuzzy activity based costing approach	Strategies
Product activity based costing		
International economic conditions related to the steel industry	Global factors related to the industry	
Global steel price fluctuations		

Table 8.

Categories and Concepts Related to Consequences

concepts	Categories	Dimensions
Increase company profitability	Increase Productivity	consequences
Cost optimization		
Reasonable pricing		
Strategic capabilities	Increase competitiveness	

Selective coding is the process of selecting the main category, systematically linking it to other categories, confirm the validity of these relationships and complete the categories that need further improvement and development. Selective coding based on the results of open coding and axial coding is the main stage of theorizing, because it systematically

relates the central category to other categories and presents those relationships within the framework of a narrative and modifies the categories that need further improvement and development (Strauss and Corbin, 2012).

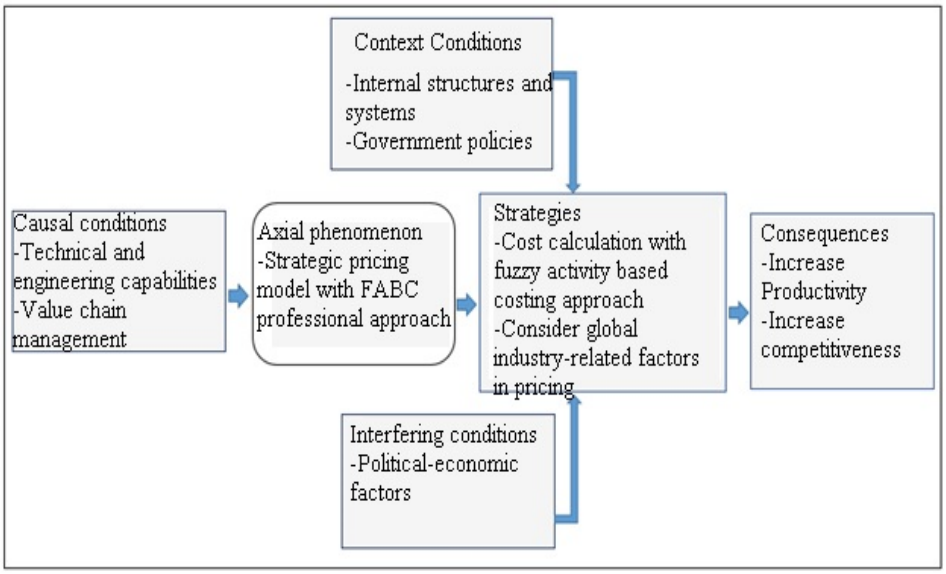

Figure 2
Strategic Model of Industrial Product Pricing with FABC Approach

Discussion and Conclusion

The present study was conducted with the aim of designing and explaining the strategic pricing model of industrial products (FABC). Pricing of industrial products as one of the most important elements of industrial marketing has a significant role in product development, distribution and promotion and product profitability for manufacturers. In order to fill this research gap, the present study has proposed a strategic pricing model for industrial products with the FABC approach. And the study population is the steel industry (Khuzestan Steel Company) because the steel industry as one of the basic industries and at the same time the mother of the country, which in addition to being the connecting link and

supplier of raw materials to many related industries, it has a significant contribution in creating employment and the possibility of currency exchange for the country and is one of the important criteria for recognizing the development of the country in the world community and proper pricing of products in this industry has always been the concern of many managers and customers of this industrial product in the market. The results of the analysis of the data extracted from the theoretical study and in-depth interviews with university professors and steel industry experts in the field of marketing and sales of products, based on the data theory of the foundation, it was collected and coded in 3 stages and the conceptual model of the research was presented as follows:

Causal conditions: Based on the results of this study, two categories of technical and engineering capability and value chain management were identified as causal factors.

Context Conditions: In accordance with the conceptual model of the research, two categories of internal structures and systems and government policies were identified as bedrock factors in order to realize the strategic pricing model of industrial products in the market.

Intervening conditions: The findings of the qualitative part of this study indicate that the category of political and economic factors is one of the factors that affect the pricing of industrial products. Accordingly, due to the nature of industry and manufactured products, the political and economic decisions of the government in the domestic and even foreign sectors are effective in adopting and implementing product pricing strategies.

Strategies: Based on the results of qualitative data analysis, two categories of cost calculation with fuzzy activity based costing approach and global factors related to industry are two key strategies in order to accurately calculate the cost of goods and at the same time according to the specific characteristics of steel products (taking into account the effects of global steel prices, exchange rates, trade wars between world powers in the field of steel, etc.), considering the global factors in determining the

price of products in the market causes a balance in the price of products offered in the market.

Consequences: According to the conceptual model presented from the analysis of qualitative research data, the implementation of the strategic pricing model of industrial products will increase productivity and increase competitiveness. Because the approach of calculating the cost of industrial products with the approach (FABC), while accurately calculating the cost associated with each of the activities performed in order to produce products, by identifying and eliminating redundant activities and defining the standard and criteria for those inefficient activities that cannot be eliminated, provides opportunities to increase productivity for the company. On the other hand, due to the accurate allocation of costs in calculating the cost of products, this possibility arises for sales and marketing managers. According to market conditions, supply and demand and customer conditions, to have more flexibility in negotiating and offering prices to their customers.

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