Available Online at www.ijcsmc.com

International Journal of Computer Science and Mobile Computing

A Monthly Journal of Computer Science and Information Technology

ISSN 2320–088X

IJCSMC, Vol. 4, Issue. 2, February 2015, pg.418 – 433

RESEARCH ARTICLE

Identify and Ranking the Obstacles to the Implementation of the Target Costing in Kavir Tire Company and Presentation of a Preliminary Conceptual Model

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Abstract

The present study has been organized into two stages. In the first stage, using library methods and interviewing the elites, the existing obstacles to the implementation of the target costing have been identified, and subsequently four hypotheses have been formed. Having these hypotheses, the preliminary conceptual model based on the organizational, individual, technological, and environmental obstacle has been designed. For a better understanding of the suggested model, it has been required that the effect of any given organizational, individual, technological, and environmental obstacle in Kavir Tire Company be investigated in more detail so that the corresponding results can be used and measured through the questionnaire. Therefore, considering the existing literature and using different information-gathering devices, as well as consultation with some other professionals in this field, a checklist associated with the dimensions (subsidiary parameters) of these four variables has been provided and used as the basis for the design of the measurement questionnaires. In the second stage, by the application of two developed questionnaires and the SPSS Software, the testing of the proposed statistical

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hypotheses and ranking of the recognized obstacles from the perspective of the statistical society involving the chief executive, the executive board members, the assistants, the commercial and the financial managers and experts, and the managers and experts in the accounting sector in Kavir Tire Company and its various representatives (as the company's customers) have been performed. These two procedures generally develop a conceptual model, on the basis of which the existing obstacles to the implementation of target costing are classified in terms of their entity.

Keywords – target costing (TG), value engineering (VE), conceptual model, organizational obstacles, individual obstacles

1. Introduction

As recorded in the literature, a dramatic increase has recently occurred in organizational inclination towards the application of some new techniques such as the target costing so that a more successful presence in the world markets can be achieved. A manager who decides to apply such a technique in his/her organization is first required to answer the following question: What parameters may set the ground for the successful implementation of the said technique?

Target costing is a technique for setting the price of the products/services in a case where the sales price is determined based on the competition and the expected profit is calculated and known in advance .Thus, it is required that the expenditures and the prime cost be arrived at a certain level so that – under the assumption of the predetermined sales price and a minimum expectable profit –these expenditures do not exceed asetthreshold.A further complicating problem, however, to the implementation of this procedure faced by the organizational management is that the reduction and control of the costs must be in line with the maintenance and even the enhancement of the quality. Therefore, it can be stated that different obstacles may arise during the implementation stage of the target costing system. The investigation and identification of these obstacles can play a fundamental role in the successful implementation of the target costing (Khoshtinat and Jameei, 2008: p.46).

2. An Overview of the Research Concepts

a) Target Costing

Target costing is a well-organized technique for determination of the cost of the life cycle. Target costing considers the cost as an input, rather than an output, for the design procedure. Consequently, by the estimation of the sales price of a given product and reduction of the marginal profit, the cost on the basis of which the product is produced (i.e., the target cost)will be determined. Therefore, the design of a product which provides both the customer satisfaction and the target cost is intended.

According to Gane, target costing demonstrates a field in which the marketing and the accounting are closely interconnected. Therefore, using such techniques as target costing, marketing, and design procedure, the desired characteristics of the product and its desired sales price are determined.

Target costing, which is a useful tool for the cost management, is apparently of equal importance in the profit management. In Japan, different companies consider the target costing not only as a strategic tool but also as part of the product expansion procedure. These companies make use of the target coating as a powerful mechanism for the realization of the competitive market challenge into the organization.

B) Value Engineering

Value engineering is a cost control technique to systematically investigate the influential factors in the prime cost of the products in a way that the product quality is maintained and the production costs are reduced and kept at the targeted level. Value engineering is considered to help in the cost management through the design improvement with the aim of the cost reduction (along with the quality maintenance) and identification of the additional functions of the product for which the customer declines to pay any further amount.

Value engineering is carried out by a team consisting of different organizational powers in different fields of engineering, product design, purchase, production, marketing, sales, and financial affairs. Broadly speaking, the value engineering has expanded beyond and outside the organization to cover the whole value chain including the material and equipment suppliers and customers.

3. Research Problems

Rapid changes in the world manufacturing industries have been brought about by the strong and intense market competitions, technological innovations, and new advances in the computer systems. In this context, those companies which are more adaptable to changing market conditions (i.e., the companies which are able to adapt their operations to the new situations)prove to be more successful, whereas the companies with no adaptability to the new situations may fail to survive and compete in the markets. Therefore, the survival in the modern competitive market conditions seems to be a great concern for any economic entity. In order to survive, these economic entities are, thus, obliged to make use of some appropriate techniques and devices for the gathering of exact, relevant, and timely information (Hejazi and Izadi, 2009: p. 33).

Provision of such information with the said characteristics mayset the ground for the economic entities' management to make logical decisions as how to survive in the new competitive conditions. Target costing is a tool which can help the economic entities to achieve this end (ibid: p. 34).

Transportation industry serves an important role in the national economic growth. Such importance in the development of the ground transportation system has resulted in the rapid development of different industries such as tire manufacturing. Due to the theoretical predictions made about the tire supply and demand in the country and with a brief glance at the nominal capacity of each manufactory and subsequently with the consideration of the possibilities for the increase in the state tire manufacturing, the need for the investigation of the new market conditions will be strongly felt. In this context,

economic entities have to produce those kinds of products which develop more values and bring in more reasonable profit than the similar products (Zareei, 2010).

Achieving this goal entails the continual strategic programming of the technology as well as the complete coordination between the different parts of the economic entity including marketing, design and engineering, production, sales, finance, etc. Target costing is a technique which can help the organizations to achieve this end (Fisher, 2010: p. 15).

In view of the above mentioning, the present study sets out to identify different obstacles to the implementation of the target costing in Kavir Tire Company so that the customer satisfaction along with the control and continual reduction of the cost (i.e., the final price) can be obtained. Besides, it is hoped that the present study can perform a positive, though limited, role in the realization of the considered objectives and the related science in practice.

4. Research Hypotheses

For the identification of the existing obstacles to the target costing implementation, the following hypotheses have been used by the present study.

Hypothesis 1: Organizational parameters have a direct effect on the implementation of the target costing in Kavir Tire Company.

Hypothesis 2:Individual parameters have a direct effect on the implementation of the target costing in Kavir Tire Company.

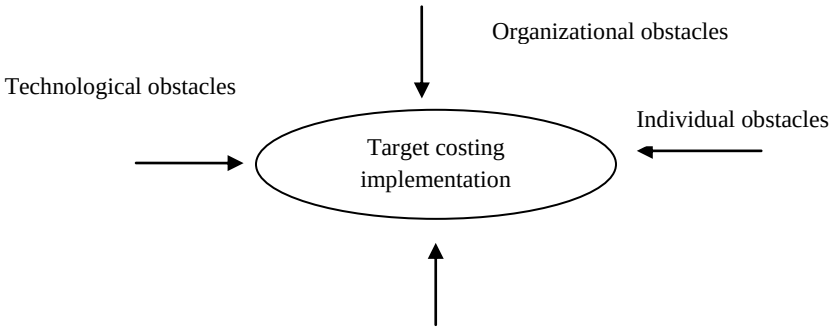
Hypothesis 3:Technological parameters have a direct effect on the implementation of the target costing in Kavir Tire Company.

Hypothesis 4:Environmental parameters have a direct effect on the implementation of the target costing in Kavir Tire Company.

5. Preliminary Conceptual Model of Study

Following the research hypotheses on the classification of the obstacles to the target costing implementation in to four categories (i.e., the organizational, individual, technological, and environmental parameters/obstacles), the preliminary conceptual model of the presented study has been developed – as represented by diagram (1).Investigation of the organizational, individual, technological, and environmental parameters/obstacles entails that each parameter be checked meticulously based on the recorded literature, explorative interviews, and distributed questionnaires so that it can be measured by the questionnaire tool.

Diagram (1.1) the preliminary conceptual model



6. Methodology

With regard to the aforementioned hypotheses and due to the fact that the present study aims to describe the obstacles to the implementation of the target costing system in Kavir Tire Company from the perspective of the experts at hand, the descriptive-surveying methodology has been here employed, and accordingly the obstacles have been classified into four distinct groups as follows.

1) Organizational obstacles, involving the discussion of the issues related to the organizational management, structure, strategic objectives, presence of the powerful decision makers, and organizational order.
2) Individual obstacles, involving the discussion of the issues related to the lack of technical experts and professionals, system implementation advisors,and protection and support of the senior managers and system users who may be opposed to the systems' implementation.
3) Technologic obstacles, involving the discussion of such issues as technology, communications, etc.
4) Environmental obstacles, involving the parameters which are out of the control and privilege of the organization and which prepare the ground for the creation of the organizational and individual obstacles.

In view of the literature and using the information-gathering tools, a checklist of the dimensions (sub-parameters) of the aforementioned quadruplet variables (i.e., organizational, individual, technological, and environmental parameters/obstacles) has been prepared. Then under a preliminary study, the list of the sub-parameters have been discussed with a group of technical experts and professionals, and subsequently by addition of some sub-parameters and removal of some other ones, a list (for more information, refer to Appendix 1) has been provided, on the basis of which two questionnaires with 39 and 14 questions have been prepared and distributed among the staffs of Kavir Tire Company and the company's representatives in Tehran, respectively. These questionnaires have been based on the septet LikertScale, and finally the descriptive and inferential statistics methods have been used for data analysis.

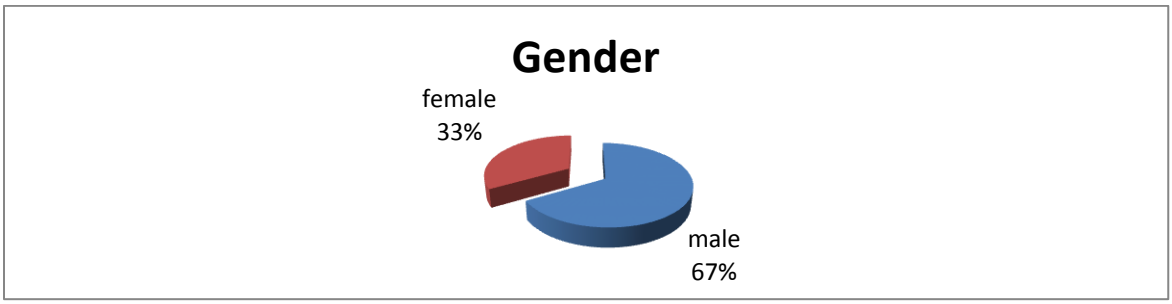
7. Statistical Society of the Study

In the present study, for the investigation and detection of the existing obstacles to the realization of the target costing method, a statistical society has been considered, which is composed of the executive, managerial board members, assistants, commerce-sector managers and experts, and finance and accounting-sector managers and experts in Kavir Tire Company (as the main agents for the implementation of the target costing in the organization) and the company's representatives (as the customers of the organization)so as to help us in the identification of the environmental obstacles to the target costing implementation.

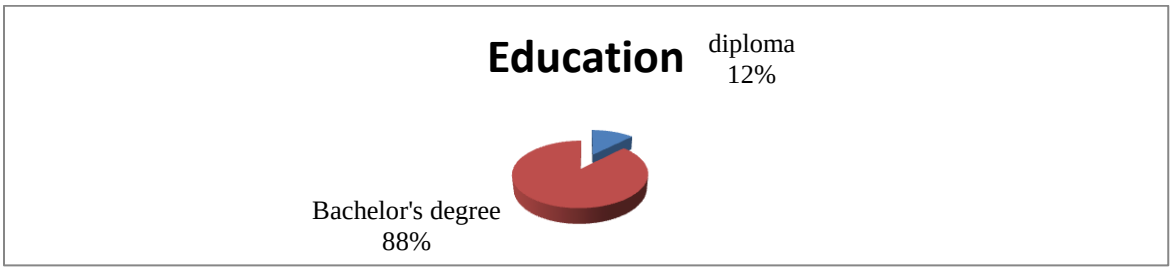
Since the statistical society volume in this study is limited, the size of the sample has been assumed to be as great as that of the society. Therefore, the questionnaire of type 1 (with 39 questions) has been distributed among 25 individuals (15 persons as being the staffs of the finance and accounting department, 5 persons as the personnel of the commerce sector, and yet 5 other persons serving as the organizational managers), whereas the questionnaire of type2 has been handed out among the active representatives of Kavir Tire Company in Tehran(12 representative on the whole).

Based on the classification of the questions in the suggested questionnaires, our obtained results have been presented in two parts – as the results related to the demographic variables and those related to the research hypotheses.

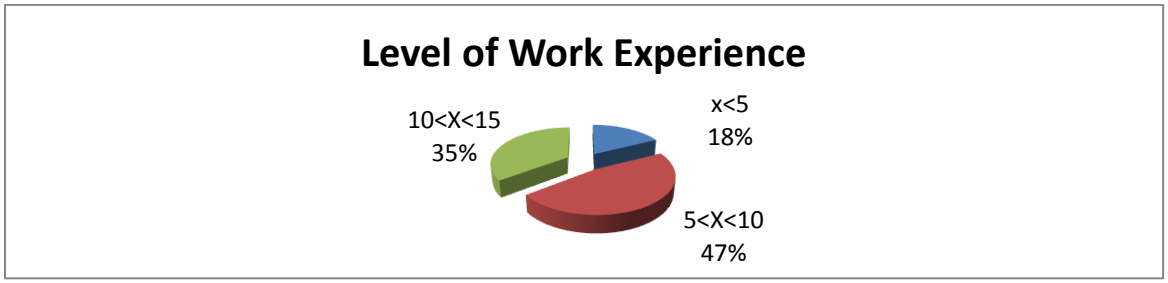
As demonstrated by the collected information associated with the gender variable in the data sample, about 66.7% of the individuals in the research sample are male and the remaining 33.3% are female respondents.



Concerning the education variable, the data show that 12.5% of the sample have a high school diploma, while 87.5% of the sample have a bachelor's degree.



Concerning the variable of work experience, it has been observed that 29% of the considered sample have worked over 15 years, 25% have worked between 10 and 15 years, 33.3% have 5 to 10 years of work experience, and the remaining 12.5% have worked for lower than 5 years.



With regard to the job position, it has been found that 16.7% of the individuals in the considered sample are subsumed under the category of the executive, the management board, and the assistants; 20.8% are among the managers and experts in the commercial sector; and 62.5% are among the financial and accounting sector of the considered organization. As regards the variable for major (i.e., the field of study chosen as an academic specialty), it has been observed that 58.3% of the respondents had accounting as their main subject of study in college, 8.3% majored in industrial engineering, 8.3% majored in commercial management, and 16.7% had studied in other academic fields. All of the questions proposed in the second part of the questionnaire (associated with the research hypothesis) are based on the seven-choice spectrum of the Likertscale and are scored as follows.

Choices: too low, very low, low, rather high, high, very high, extremely high

Score: 1, 2, 3, 4, 5, 6, 7

The number of respondents in the sample society is as follows.

Financial-accounting sector staffs: 15 persons (total society)

Commercial sector staffs: 5 persons (total society)

Managerial staffs: 5 persons (total society)

Active representatives in Tehran: 12 persons (total society)

The questionnaires have been handed out in proper numbers among the sample society. In this study, the stability or reliability of the questionnaire has been calculated based on the Cronbach's alpha and Classification Method susing the SPSS Software. In this context, the Cronbach's alpha coefficients of the questionnaire for the company and its active representatives in Tehran have been obtained to be 92.9% and 70.4%, respectively. Moreover, the two reliability coefficients of Spearman-Brown and Guttman have found to be 89% and 82% for the company and its representatives, respectively (which seem to be acceptable results).Thus, it can be concluded that the presented questionnaire involves some appropriate reliability.

In the inferential statistics section, for the investigation of the normality of the data, the Kolmogorov Smirnov one-sample Test has been used. This test has been performed to differentiate between the use of parametric and nonparametric tests, where the significance level (divided by two) in all quadruple variables (i.e., organizational, individual, technological, and environmental) is larger than $\alpha/2$ (namely, 0.025) and on the other hand the value of statistic z is lower than 1.96. Therefore, at the significance level of 95% the hypothesis for the data normality is justified. In this context, due to the normality of all data, parametric tests have been used for the data analysis throughout the present study.

Then, a question has been posed as follows. Is there any significant difference between the variables in different parts of the sample? In order to answer this question, the following hypothesis has been examined in view of the three variables of organizational, individual, and technological parameters (since in the questionnaire of financial and accounting sector the environmental parameters have not been considered)using the one-way variance analysis, where the significance levels of Fisher statistic for the aforementioned parameters are 0.164, 0.310, and 0.677, respectively, which is greater than the value of 0.05. Therefore, at the significance level of 95% it has been justified that no difference exists between the averages of the organizational, individual, and technological parameters in any sector.

Regarding the investigation of the internal parts of the organization in terms of the variable for the environmental parameters, since environmental parameters have been disregarded in the accounting department of the considered organization, the independent *t* test has been used to compare the managerial and the commercial sectors.

On the other hand, since the number of the samples in these two parts are not equal, Fisher's exact test has first been employed to examine the assumption of the variances equality. In view of this and due to the fact that the value of the obtained significance level (0.62) is larger than 0.05, the assumption of the equality of variances can be verified. On the other hand, due to the fact that the obtained significance level for the averages comparison test is 0.80, which is greater than 0.025, the assumption that no difference exists in these parts in terms of the environmental parameters can be justified.

To investigate the status of the variables in the company and in its representatives and to answer the following question as whether any significant difference exists between the attitude of the staff in the organization and that of the staff in itsrepresentatives,*t* testfor independent samples as well as Fisher's exact test have been conducted to investigate the variances equality assumption, the results of which are represented in Table 1.

As it can be observed, concerning the organizational parameters, due to the fact that the value of the obtained significance level (0.321) is greater than 0.05, the assumption of variances equality is approved.

Furthermore, since the value of the significance level for the averages comparison test (0.456)is larger than 0.025, the following assumption can be justified that no difference exists between the organization and its representatives in terms of the variable for the organizational parameters.

With regard to the technological parameters, due to the fact that the value of the corresponding significance level (0.090) is larger than 0.05, the variances equality assumption can be verified.

Besides, since the value of the significance level for the averages comparison test (0.57) is larger than 0.025, the following assumption can be justified that no difference exists between the organization and its representatives due to the technological parameters.

Concerning the environmental parameters, due to the fact that the value of the corresponding significance level (0.892) is larger than 0.05, the variances equality assumption can be verified.

Furthermore, since the value of the significance level for the test of comparison of averages (0.376) is larger than 0.025, the following assumption can be justified that no difference exists between the organization and its representatives in terms of the variable for the environmental parameters.

Table 1. investigation of the variables within the organization and in its related representatives

		Variances Equality Test		Averages comparison test						
		The value of the statistic F	Significance level	T Statistic	Degree of Freedom	Significance level (two-way)	Difference of Averages	Standard Error	Safety Distance 95% for the difference of Averages	
									Lower Level	Higher Level
Organizational Parameters	Variances equality assumption	**1.016**	**0.321**	**-0.7**	**31**	**0.456**	**-0.335**	**0.443**	**-1.239**	**0.569**
	Without the Assumption of Variances equality			**-0.7**	**15.090**	**0.488**	**-0.335**	**0.471**	**-1.338**	**0.669**
Technological Parameters	Variances equality assumption	**3.071**	**0.090**	**0.59**	**31**	**0.557**	**0.354**	**0.596**	**-0.861**	**1.569**
	Without the Assumption of Variances equality			**0.71**	**27.014**	**0.481**	**0.354**	**0.495**	**-0.662**	**1.370**
Environmental Parameters	Variances equality assumption	**0.019**	**0.892**	**-0.9**	**17**	**0.376**	**-0.376**	**0.414**	**-1.249**	**0.497**
	Without the Assumption of Variances equality			**-0.9**	**16.959**	**0.375**	**-0.376**	**0.412**	**-1.246**	**0.494**

Using the one-sample *t* test, the research hypotheses have thus been examined as follows.

Hypothesis 1:

Organizational parameters have a direct effect on the implementation of the target costing in Kavir Tire Company.

Table 2. Examination of Hypothesis 1 $\begin{cases} H_0 : \mu \leq 4 \\ H_1 : \mu > 4 \end{cases}$

	Test value = 4					
Organizational Parameters	*T* Statistic	Degree of Freedom	Significance Level (two-way)	Difference of Averages	Safety Distance 95%	
					Lower level	Higher Level
	5.27	32	0.000	1.066	0.65	1.47

According to Table 2 and due to the fact that the obtained significance level in the test (0.000) is less than 0.025, at the significance level of 95% the null hypothesis can be firmly rejected while the reverse (i.e., the alternative hypothesis) is accepted. On the other hand, since the values of both the lower and the higher levels of the safety distance are positive, it can be stated that the average of the considered variable is larger than the test value (4), and hence this variable produces a positive (direct) effect. In view of the aforementioned statement, it can be said that organizational parameters exert a direct effect on the implementation of target costing in Kavir Tire Company.

Hypothesis 2:

Individual parameters have a direct effect on the implementation of the target costing in Kavir Tire Company.

Table 3. Examination of Hypothesis 2 $\begin{cases} H_0 : \mu \leq 4 \\ H_1 : \mu > 4 \end{cases}$

	Test value = 4					
Individual Parameters	*T* Statistic	Degree of Freedom	Significance Level (two-way)	Difference of Averages	Safety Distance 95%	
					Lower level	Higher Level
	3.828	22	0.001	1.113	0.51	1.71

According to Table 3 and due to the fact that the obtained significance level in the test (0.001) is less than 0.025, at the significance level of 95% the null hypothesis can be firmly rejected while the reverse (i.e., the alternative hypothesis) is accepted. On the other hand, since the values of both the lower and the higher levels of the safety distance are positive, it can be stated that the average of the considered variable is larger than the test value (4), and hence this variable is assumed to bring about a positive (direct) effect. In view of the above mentioning, it can be stated that individual parameters exert a direct effect on the implementation of the target costing in Kavir Tire Company.

Hypothesis 3:

Technological parameters have a direct effect on the implementation of the target costing in Kavir Tire Company.

$$\begin{cases} H_0 : \mu \leq 4 \\ H_1 : \mu > 4 \end{cases}$$

Table 4. Examination of Hypothesis 3

	Test value = 4					
Technological Parameters	*T* Statistic	Degree of Freedom	Significance Level (two-way)	Difference of Averages	Safety Distance 95%	
					Lower level	Higher Level
	3.401	32	0.002	0.921	0.36	1.47

Based on Table 4 and due to the fact that the obtained significance level in the test (0.002) is less than 0.025, at the significance level of 95% the null hypothesis can be firmly rejected while the reverse (i.e., the alternative hypothesis) is accepted. On the other hand, since the values of both the lower and the higher levels of the safety distance are positive, it can be stated that the average of the considered variable is larger than the test value (4), and hence this variable is assumed to bring about a positive (direct) effect. In view of the aforementioned statement, it can be said that technological parameters exert a direct effect on the implementation of the target costing in Kavir Tire Company.

Hypothesis 4:

Environmental parameters have a direct effect on the implementation of the target costing in Kavir Tire Company.

Table 5. Examination of Hypothesis 4

$$\begin{cases} H_0 : \mu \leq 4 \\ H_1 : \mu > 4 \end{cases}$$

	Test value = 4					
Technological Parameters	*T* Statistic	Degree of Freedom	Significance Level (two-way)	Difference of Averages	Safety Distance 95%	
					Lower level	Higher Level
	3.755	18	0.001	0.771	0.34	1.20

Based on Table 5 and due to the fact that the obtained significance level in the test (0.001) is less than 0.025, at the significance level of 95% the null hypothesis can be firmly rejected while the reverse (i.e., the alternative hypothesis) is accepted. On the other hand, since the values of both the lower and the higher levels of the safety distance are positive, it can be stated that the average of the considered variable is larger than the test value (4), and hence this variable is assumed to produce a positive (direct) effect. In view of the aforementioned statement, it can be said that environmental parameters exert a direct effect on the implementation of the target costing in Kavir Tire Company.

8. Results Analysis

Index ranking through averaging of the indices in the management part shows that the environmental parameters with the average of 3.38 is of the highest importance. This is followed – in order of importance –by the technological parameters with the average of 3.13, the individual parameters with the average ranking of 2.25, and lastly the organizational parameters with the average of 1.25.

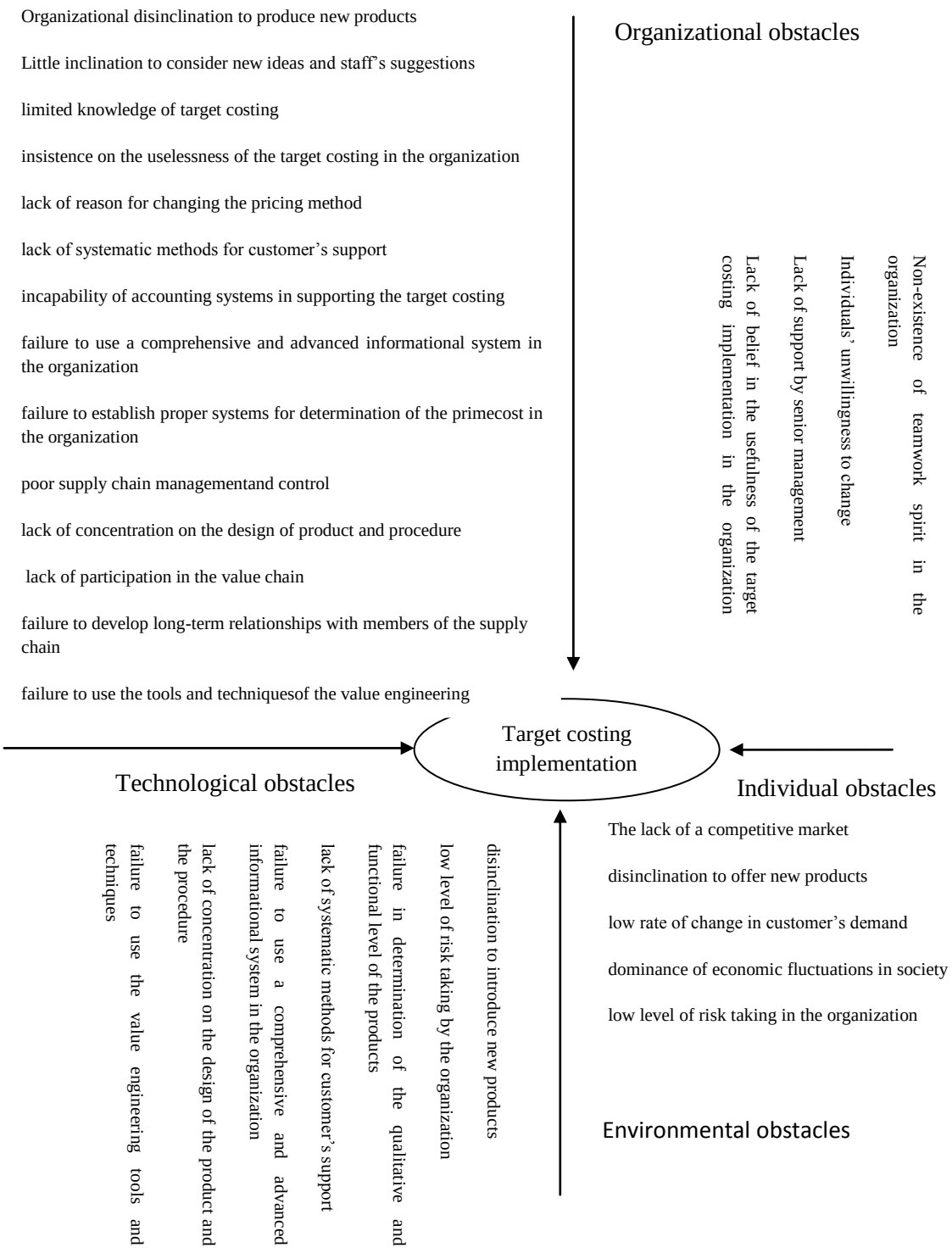
In commercial part, the mean of the rankings demonstrates that the most importance is attached to the organizational parameters with the average ranking of 3. This is followed – in order of importance – by the individual parameters with the average ranking of 2.89, the technological parameters with the average ranking of 2.56, and finally the environmental parameters with the average of 1.56. Index ranking in the accounting part demonstrates that the first importance is placed on the individual parameters with the average ranking of 2.36, second is the organizational parameters with the average ranking of 1.92, which is then followed by the technological parameters with the average ranking of 1.72.

From the perspective of the active representatives of Kavir Tire Company in Tehran, the greatest importance is placed on the organizational parameters with the average ranking of 2.45, which is then followed by the environmental and the technological parameters with the average ranking of 1.9 and 1.65, respectively.

9. Research Findings

Results of the final conceptual model proposed through the present study can be expressed as follows.

Diagram 2. The Final Conceptual Model of the Present Study



10. Conclusion

The present study has demonstrated the particular importance attached to the problem of cost reduction and profitability increase in tire manufacturing industries. In this context, it has been proposed that the application of the target costing as an innovative and result-oriented technique –which has recently provided beneficial and significant results in many companies throughout the world, not least in Japan and America – can pave the way for the development and internalization of the economic output-oriented approach concerning the macroeconomic and administrative management in tire manufacturing industries. Investment for education and implementation of the philosophy, thought, and methodology of the target costing in the state tire manufacturing is, thus, expected to facilitate and promote a rapid movement towards the provision of the relatively stable and real benefits, bridging the gap with the modern world industries, and hence production of more competitive products in the world markets. In view of the above statement and due to the importance attached to the market as the determining factor in the modern world economy, it is hoped that Iranian tire manufacturing industries can be saved from any undue reliance on the government subsides or closed economy, where the doors of the country are closed to international competition and no trade is carried out with other economic systems.

Appendix 1.

Here, a list of the quadruple obstacles (i.e., organizational, individual, technological, and environmental parameters) and the corresponding sub-parameters is provided. These have been used in the design of the questions in the questionnaire.

Group 1: dimensions related to the organizational obstacles

1. Organizational disinclination to produce new products
2. Little inclination to consider new ideas and suggestions of the personnel
3. limited knowledge of target costing
4. insistence on the uselessness of the target costing in the organization
5. lack of reason for changing the pricing method
6. lack of systematic methods for customer support
7. incapability of the accounting systems in supporting the target costing
8. failure to use a comprehensive and advanced informational system in the organization
9. failure to use the tools and techniques of the value engineering
10. poor supply chain management and leadership
11. lack of concentration on the design of product and procedure
12. lack of participation in the value chain
13. failure to develop long-term relationships with members of the supply chain
14. lack of appropriate investment in the R & D
15. failure to establish proper systems for determination of the prime cost in the organization

Group 2: dimensions related to the individual obstacles

1. lack of teamwork spirit in the organization
2. Individuals' unwillingness to change

3. lack of belief in the usefulness of the target costing implementation in the organization
4. lack of support by senior management
5. lack of familiarity with the target costing
6. insistence on the uselessness of the target costing in the organization

Group 3: dimensions related to the technological obstacles

1. disinclination to introduce new products
2. low level of risk taking by the organization
3. failure in determination of the qualitative and functional level of the products
4. lack of systematic methods for customer's support
5. lack of concentration on the design of the product and the procedure
6. failure to use the value engineering tools and techniques
7. failure to use a comprehensive and advanced informational system in the organization

Group 4: dimensions related to the environmental obstacles

1. the lack of a competitive market
2. disinclination to offer new products
3. low rate of change in customer's demand
4. low level of risk taking in the organization
5. dominance of economic fluctuations in society
6. inappropriate marketing due to the undue reliance on the car manufacturers

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