

# Identifying the Implementation Barriers of Strategic Management using Factor Analysis and TOPSIS Technique

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## Abstract

This study, with the aim of ranking and improving the implementation barriers of strategic management in Petro-pars Company (PPC), enjoys key tools of the Multi-Criteria Decision Making. The result of indicators importance ranking using TOPSIS technique reveals that three indicators, including ineffective senior management team, conflict at organizational culture for resistance against implementation of strategic planning and lack of consensus among the organization leaders, are of the greatest importance as barriers. Indicators such as non-use of internal leaders knowing the necessities and how-ness of implement improvement and lack of support by senior managers have the less importance.

**Keywords:** Multi-Criteria Decision Making, TOPSIS Techniques, Strategic Management

## 1. Introduction

In all organizations, passing through the strategy formulation phase and being put in the phase of strategy running require a shift in responsibilities. It means that responsibility is removed from strategists' duty and assigned to the units' managers. Unfortunately, most problems and barriers in making this strategy will appear in this phase and this responsibility shift makes problems in the implementation stage.

Problems often reveal themselves during performing the strategy, and art of a manager is to move through organization's mission and vision by overcoming difficulties in running and implementation. Undoubtedly, an appropriate strategy can reduce many of the problems but they are never eradicated completely. The basic problem of organizations does not lie in the formulation stage but in the implementation. Many organizations, after strategy formulation, leave it out and imagine that they have actually reached their goals by strategy formulation. Other organizations apply strategies incompletely and sometimes primitively which, in all these cases, have nothing but wasting resources and disappointing personnel from the determined strategies.

In recent years, several reasons have caused that insightful managers understand that the traditional form of management would not be able to solve their problems. So, taking advantage of strategic and long-term management has been proposed as a necessity in governments, organizations and societies. In past years, several approaches have been proposed in relation to strategic management most of which have been developed in accordance with characteristics of the public sector. Nevertheless, private organizations and their role in promoting the material and spiritual welfare of the population are so important making consideration to management inevitable more than ever. Hence, the situation which is not look much like the past years will cause private organizations also engage in a new form of thinking action. In this new form of thought and action, undoubtedly, this strategic management has the most prominent position. (Raps, 2005). Knowledge management processes do not apply solely to the methods of collecting knowledge, processing it and using it to improve the operational processes of the organization. Obtaining knowledge from generally accessible information resources implies the use of information management processes including the following topics (Ogiela & Ogiela, 2014).

## **2-Review of the Literature**

In their research, Ghafarian & Aliahmadi (2001) investigated the information about the failed strategies of large companies such as Xerox, K-Mart, etc. and analyzed them using the methodology of Growth Theory<sup>1</sup>. The results of their work were tens of concepts and two new finding about failure reasons of strategic planning. In the first finding, six main reasons for the failure of strategies have been proposed. These reasons, along with tens of supporting factors (conceptions) have been provided in the form of a causal conceptual network. In the second finding, a new concept named demand-based planning<sup>2</sup> has been introduced as the third largest corporate propeller along with the strategic and long-term planning (Shahnushi, 2005).

In a research, Hanafizadeh, & Ghafouri (2009) investigated the key factors of success in strategic planning of Information systems of investment companies whose main duty is providing professional management of investment funds invested by shareholders. In their research, by using balanced assessment ways and methodology of success key factors, which is one of the strategic planning ways, they have named critical success factors of strategic planning of information systems. It is worth mentioning that lack of any of these factors in strategic planning is counted as a barrier at this way and faces it with some problems.

In their study, Afjei, & Ismailzade (2009) have examined the relationship between human resources and company performances. The strategic approach in human resources management means application of innovative techniques and methods that organizations, by relying on them, can show appropriate reactions against non-sustainable environment and mobilize human resources in order to gain a competitive advantage (Porter, 1985). Researchers investigated the performance of those companies having strategic view and those who have traditional views in managing human resources. The results of their research revealed that companies' performances which have strategic view is better than those who have traditional views. Investigating the research literature and traditional companies, they found that barriers of having the strategic view in management section of human resources are:

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<sup>1</sup> - Grounded Theory

<sup>2</sup> - Intent Planning

- 1) Lack of services compensation policies and appropriate high payment based on the performance of these companies;
- 2) Lack of policies of human resources for teaching and development of human resources in organizations;
- 3) Lack of any effective relationships and sharing information in organizations;
- 4) Existence of discrimination and difference as a policy for upgrading people;
- 5) Lack of policies of human resources for flexible work program in these organizations;
- 6) Lack of policies of human resources for developing management;
- 7) Lack of a special policy in the field of employing the human resources.

They also came to the conclusion that in organizations which have the viewpoint of strategic management on their human resources, seven barriers have been used well as key factors of success in this field. Dastjerdi et al (2009) identified the barriers of implementation of strategic decisions in organizations of health care section of Iran, and, then ranked them by Freedman’s statistical test. Barriers and identifications are mentioned in table (1) (Malaki, Mohaghar, Dastjerdi et al., 2010).

Table (1).

Definitions of barriers of strategic decisions implementation (reference: Dastjerdi et al (2010))

1	Resource constraints	Money, materials and human resources are insufficient to apply a strategic decision
2	Background	The Organization is notorious in applying its strategic decision in front of its staff
3	Weak and inappropriate communications	Sharing information between different units is not effective
4	Conflicting goals and priorities	goals and strategies which are followed in the organization are multiple and incongruence
5	Environmental uncertainty	External unpredicted problems will appear during performing the strategy
6	Inconsistency	Consistency of performing activities are weak and inefficient
7	Disable human resources	employers who are involved in performing the strategy do not have necessary abilities

In a research, barriers of executing the strategies of labor force flexibility have been investigated in seven factories of Canada. The identified following barriers as the most important barriers of executing these barriers and mentioned that overwhelming them is the most important success factor. These barriers include: (Oke, 2007)

- Lack of unity in executing the strategy;
- Resistance against change by labor forces and their supervisors;
- Avoiding from reviewing the strategic plans executed by staff and managers;
- slow implementation strategy;
- Failure to understand the flexibility incentives of labor forces by managers and supervisors;
- Inefficient relationship and consulting;
- The lack of incentive to labors to do the best;
- Lack of suitable timetable for implementation of the strategy;

- Lack of voluntary participation;
- Unavailability of skilled labors;
- Lack of complementary strategies for the main strategy;
- Lack of proper and appropriate training.

In another study, barriers for executing the strategy in Norwegian Shipbuilding Company were analyzed. The data were collected using open interview with employers and managers of these companies. According to the results, researchers identified these barriers as the most important barriers of executing strategies [9]: (Heide & Gronhaug & Johansson et al., 2002).

- Barriers caused by lack of relationship;
- Barriers caused by inappropriate organizational structure for executing the strategy;
- Barriers for staff's learning;
- Lack of qualified managers in the department of personal management;
- Cultural barriers;
- Political barriers;
- Barriers related to lack of resources to implement the strategy.

In one of the review studies, reviewing the literature in the field of strategy executing; some barriers were found and solutions proposed for removing them as following [8]: (Hrebiniak, 2006).

- Failure to manage the changes and overcoming on the resistance against these changes;
- The strategy formulation that is unclear and poor;
- Lack of advisor and instructions that can lead the strategic execution effectively;
- Presenting the information among individuals and those who are responsible for strategy implementation appropriately and ineffectively;
- Trying to implement the strategies that are in conflict with the organizational structure;
- Unclear responsibility for implementation of the strategy and its operations.

Bryson believes that Strategic management is a set of concepts, procedures and tools which are designed to help leaders, managers in order to performing their duties. In fact, it can be considered as a structural performance for making decisions and doing fundamental actions which besides forming an organization, it also determined what an organization is? What it does? And why it should do the job? [4] (Pyres & Robinson, 2001).

According to the great number of private organizations in Iran and their positive approach based on using strategic management knowledge, dealing with these problems is a vital act. So, what is of great importance is the doing primary research for investigating the done activities and doing researches in the field of the determined calcification. Since no research has been done in our country, we must refer to original references. In this study, we will try to examine the fundamental problems of the private contraction organizations about executing strategic management. In addition, taking advantage of opinions of managers and specialists of oil contractor companies of the South Pars field, the main barriers will be identified in order to remove the barriers using multi criteria decision-making methods.

Due to the actions taken in the field of the strategy development in country, no significant step has been taken towards the implementation and execution of the strategies. Therefore, further study and examination about implementation are undeniable. To do so, at first, the problems of the South Pars oil contracting companies will be examined, and, after that, we try to provide suitable solutions by prioritizing the problems (Raps, 2005).

### 3-TOPSIS technique

This method was [resented in 1981 by Yun and Huang<sup>3</sup>. In this method, the m factor or option is evaluated by an individual or group of decision-makers. This technique is formed based on the notion that each factor must have the minimum distance to positive ideal factor (the most important) and the maximum distance to the negative ideal factor (the less important factor). In other words, in this method, distance of a factor is measured by positive and negative ideal factors and it is a criterion for ranking and prioritization of the factors; phases of this method include:

**Determination of the matrix of comparison of the factors:** At this phase, a matrix will be drawn; in its row the factors, in its columns the people who have opinions and in the crosses of row and column the importance which every respondent assigns for each factor are presented.

**Rij:** the *i*<sup>th</sup> person's opinion about *j*<sup>th</sup> factor which is presented in the 7-option Likert scale (1 to 7).

**Normalizing the decision-making matrix:** In order to be comparable, the different scales of measurement of decision-making matrix are changed into normalized matrix or scale-less weighted matrix using the following formula:

$$n_{ij} = \frac{r_{ij}}{\sqrt{\sum_{i=1}^m r_{ij}^2}}$$

**Determining a positive ideal and negative ideal factor:** At this phase, the factors that are determined as the most and the least important should be identified in other words:

$$\text{Positive ideal option} = A^+ = \left\{ \left( \max_i V_{ij} \mid j \in J \right), i = 1, 2, \dots, m \right\} = \{V_1^+, V_2^+, \dots, V_n^+\}$$

$$\text{Negative ideal option} = A^- = \left\{ \left( \min_i V_{ij} \mid j \in J \right), i = 1, 2, \dots, m \right\} = \{V_1^-, V_2^-, \dots, V_n^-\}$$

**Calculating the separation size (distance):** at this phase, the distance of every factor from ideal positive or negative options should be determined; so, distance of the *i*<sup>th</sup> option with ideals is as following using Euclid approach:

$$\text{Distance of } i^{\text{th}} \text{ option from positive ideal: } = d_i^+ = \left\{ \sum_{j=1}^n (V_{ij} - V_j^+)^2 \right\}^{0/5}; i = 1, 2, \dots, m$$

$$\text{Distance of } i^{\text{th}} \text{ option from negative ideal: } = d_i^- = \left\{ \sum_{j=1}^n (V_{ij} - V_j^-)^2 \right\}^{0/5}; i = 1, 2, \dots, m$$

**Calculating the nearness rate of each of the factors to positive and negative ideal options:**  $C_i$  is calculated by the following formula:

$C_i = \frac{\text{The distance to the negative ideal}}{\text{The distance from the positive ideal} + \text{The distance from negative ideal}}$

The more the  $C_i$  the more important is the factor. In other words,  $C_i$  will be the classification of factors based on the descending order:

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<sup>3</sup> Yoon & Hwang

$$n_{ij} = \frac{r_{ij}}{\sqrt{\sum_{i=1}^m r_{ij}^2}}$$

#### 4. Research method

At this phase, according to the literature review, indicators related to implementation barriers of strategic management would be extracted and with using the viewpoints of managers and experts of South Pars oil contracting companies, degree of importance of each indicator presented. Thus, using factor analysis, validity of indicators shall be approved in this organization. Using multi-criteria decision-making techniques, specially the TOPSIS technique, we will examine the importance of each of the barriers of implementation of the Strategic Plan for South Pars.

##### 4-1- Examination of the three factors effectiveness:

In this section, data analysis results of each of the three dimensions in PPC (Petro-Pars Company) will represent.

**The first Hypothesis:** The first group of barriers (leadership and management) has a significant impact on PPC.

To examine this hypothesis, the following statistical hypothesis was designed.

The first group of barriers has no significant effect on PPC.  $H_0 : \mu \leq 4$

The first group of barriers has a significant impact on PPC.  $H_1 : \mu > 4$

It should be mentioned the reason using 4 in this test as a benchmark is a Book (December, 1994) upon which, in 7-options Likert, the average of tests shouldn't be considered 3.5; rather, 4 should be used for increasing the accuracy. To test this hypothesis, the one-way t-student test was used whose results are shown in table 2.

Table 2-  
the results of the first hypothesis in PPC (leadership and management)

	Test Value = 4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Factor 1	-3.721	39	.001	-.69000	-1.0651	-.3149

As it is shown in table 2, in the level of significance %95, the  $H_0$  is rejected and the  $H_A$  is approved. It means that the barriers of first group have a significant effect on PPC.

**The second hypothesis:** the second group of barriers (human resources) has a significant effect on PPC.

To examine this hypothesis, the statistical hypothesis is formulated as following:

The second group of barriers has no significant effect on PPC.  $H_0 : \mu \leq 4$

The second group of barriers has a significant impact on PPC.  $H_1 : \mu > 4$

To test this hypothesis, the one-way t-student test was used whose results are shown in table 3.

Table 3-  
the results of the second hypothesis in PPC (human resources)

	Test Value = 4					
	T	df	Sig. (2- tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Factor 2	-3.020	39	.004	-.53000	-.8850	-.1750

As the above table shows, in significance level of 95%, the null hypothesis is rejected and the alternative hypothesis is approved. This means that the barriers of the second group have a significant impact on PPC.

**The third Hypothesis:** The third group of barriers (strategic activities), has a significant effect on PPC.

To examine this hypothesis, the following statistical hypothesis was designed.

The third group of barriers has no significant effect on PPC.  $H_0 : \mu \leq 4$

The third group of barriers has a significant impact on PPC.  $H_1 : \mu > 4$

To test this hypothesis, one-way t-test–student was used whose results are shown in Table

4.

Table 4- the results of the third hypothesis in PPC (strategic activities)

	Test Value = 4					
	T	df	Sig. (2- tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Factor 3	-1.845	39	.000	-.31167	-.6533	.0300

As the above table shows, in significant level of the 95%, the null hypothesis is rejected and the alternative hypothesis is approved. This means that the barriers of the third group have a significant impact on PPC. Examining the research hypothesis showed that the three barriers have significant influences on PPC; now the question is that are the effect of these three factors the same or not? To answer this question, analysis statistical method of variance (ANOVA) was used. The hypothesis related to this test is as following:

There is no significant difference among the effectiveness rate of three main barriers of strategic management implementation.  $H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4$

There is significant difference among the effectiveness rate of three main barriers of strategic management implementation.  $H_1 : \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4$

The results of the ANOVA test are shown in Table 5. This test was done using SPSS software.

Table 5-  
results of variance analysis in PPC

ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	4.597	3	1.532	1.131	.000
Within Groups	211.371	156	1.355		
Total	215.969	159			

The results of the variance analysis indicated that in the significance level of 95%, there is a significant difference among the effectiveness of three barriers of strategic management implementation.

#### 2-4-TOPSIS implementation

At first, the indices are ranked based on TOPSIS technique and, then, based on the current status and results of TOPSIS, the indicators with high importance and low performance are determined as input of the quality room. Results of ranked indicators according to the TOPSIS technique are shown in table (6) and ranking of indicators in table 7. It should be mentioned that the reason of using TOPSIS technique is that this technique is specific for cases that their numbers of indicators and respondents are very high. In cases where the numbers of indicators and experts are low, the AHP technique can be used for ranking [1] (Asgharpur, 2004).

The result of ranking the indicators with TOPSIS technique show that the following 16 parameters are important in the first half.

According to the results of table of the indicators importance using TOPSIS technique, we can consider a quarter of the above indicators important [1]. But for making the results more accurate, in this study, half of the top indicators of table 6 are considered as the important first 16 indicators. Now we should see that which of the sixteen indicators less than the average of 3.5. As table 6 shows, 7 barriers have such conditions.

Table 6:  
ranking the importance of the indicators with Topsis technique

The distance to the negative ideal	The distance to the positive ideal	Importance degree	Indicator number	indicator name	Ranking
<b>0.012</b>	<b>0.007</b>	<b>0.644</b>	<b>A1</b>	Ineffective senior management team	<b>1</b>
<b>0.012</b>	<b>0.008</b>	<b>0.598</b>	<b>A30</b>	Conflict in organizational culture to resist the implementation of strategic planning	<b>2</b>
<b>0.01</b>	<b>0.009</b>	<b>0.531</b>	<b>A4</b>	Lack of consensus among the leaders of the organization	<b>3</b>

0.01	0.009	0.511	A32	Failure to employ a consultant who has already had experience in other companies	4
0.009	0.009	0.5	A16	key activities of the implementation have been identified Weakly	5
0.01	0.01	0.495	A21	desire to stability in every organization	6
0.009	0.01	0.489	A7	Top-down leadership style or Administrator laissez-faire	7
0.009	0.01	0.482	A9	Lack of middle managers' skills	8
0.009	0.01	0.478	A22	Planners' lack sufficient interaction with the executive implementation	9
0.009	0.01	0.475	A2	Managers are trained to plan, not implement	10
0.009	0.01	0.472	A27	Managers lack confidence for long-term planning and execution of strategic plan goals	11
0.009	0.01	0.47	A26	Working against the power structure.	12
0.009	0.01	0.467	A25	Lack of funds towards activities that their success are critical	13
0.009	0.01	0.466	A17	The problems of developing process, including credit planning, budgeting and split the reward.	14
0.009	0.01	0.463	A8	Senior financial and strategic objectives, inability to communicate effectively with subordinates	15
0.009	0.01	0.462	A14	Lack of adequate human resources, lack of adequate personnel make needed changes	16
0.009	0.01	0.46	A23	Set the inappropriate start time to implement	17
0.009	0.011	0.445	A20	Many people being involved in the implementation	18
0.009	0.011	0.443	A10	Lack of knowledge of the management team to achieve the specified strategy	19
0.008	0.011	0.441	A5	Lack of managers and staff awareness of the organization's strategic planning	20
0.008	0.011	0.437	A24	Lack of financial resources, lack of sufficient money to do the project objectives	21

0.008	0.011	0.43	A29	Uncontrollable external factors that will cause problems	22
0.008	0.011	0.427	A18	Competitive disrupt the implementation	23
0.008	0.011	0.427	A15	Organizational structure is based on lack of merit, ability and resistance to apply the strategy	24
0.008	0.011	0.411	A19	Lack of model to guide implementation	25
0.008	0.011	0.408	A31	Inappropriate method to evaluate the efficiency strategy	26
0.008	0.012	0.407	A12	Lack of staff's sufficient ability to perform in line with the strategic planning	27
0.008	0.012	0.403	A13	Lack of adequate training for low level staff	28
0.008	0.012	0.398	A28	Unpredictable domestic trade problems appears gradually .	29
0.007	0.012	0.383	A3	Inability to manage change effectively	30
0.007	0.012	0.345	A6	Lack of senior managers support	31
0.006	0.013	0.318	A11	Not using the internal leader that they know what implement needs further are and how to implement implementation.	32

Table7:  
The result of ranking indicators with TOPSIS technique

Ranking	Indicator's name
1	Ineffective senior management team
2	Conflict in organizational culture to resist the implementation of strategic planning
3	Lack of consensus among the leaders of the organization
4	Failure to employ a consultant who has already had experience in other companies
5	key activities of the implementation have been identified Weakly
6	desire to stability in every organization
7	Top-down leadership style or Administrator laissez-faire
8	Lack of middle managers' skills
9	Planners' lack sufficient interaction with the executive implementation

10	Managers are trained to plan, not implement
11	Managers lack confidence for long-term planning and execution of strategic plan goals
12	Working against the power structure.
13	Lack of funds towards activities that their success are critical
14	The problems of developing process, including credit planning, budgeting and split the reward.
15	Senior financial and strategic objectives, inability to communicate effectively with subordinates
16	Lack of adequate human resources, lack of adequate personnel make needed changes

## 5. Conclusions

As it was mentioned, forming a strategy without its implementation is nothing but waste of resources, and due to the growing procedure of strategy forming in our country and lack of enough attention to the issue of implementation, this study tried to examine the problems of implementation, provide a new approach, push the managers' attention towards the implementation of this strategy and take a new step by introducing the problems of strategy implementation and classifying them.

This study analyzed the data collected from a statistical sample of PPC. Eventually, thirteen key performance indicators were presented to the PPC managers as ways of improving the operations including separation of ownership from management, making employees share in company profits, creating a knowledge-sharing strategy, creating a job description associated with the implementation of the strategy, creating a schedule for implementation of the strategy, creating of training courses, developing the career path and promotion, allocating a budget for using foreign consultants, making a feedback system, developing work teams and creating competition between them, holding frequent meetings during the implementation of the strategy, accepting new ideas and thoughts of personnel, determining the criteria of successful strategy implementation among which the PPC is better than its competitors in three indicators.

On the other hand, the indicators of developing work teams and creating competition between them as well as creating a knowledge-sharing strategy system that have the highest absolute and relative weight, are of greater importance in the implementation process. Most of the proposed solutions have the low-cost and low-degree of hardness which can assure the of implementation success of them with regard to the resources of the organization.

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