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**THE DETERMINATION AND PRIORITY OF EFFECTIVE FACTORS ON THE
ESTABLISHMENT OF SIX SIGMA IN THE GAS COMPANY OF WESTERN
AZARBAIJAN PROVINCE**

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ABSTRACT

The process of six- sigma is applying increasingly in various processes; it is used ranging from the production to the various transaction activities. This process has been established in the reduction of variables intensely and the rate of breakage of working critical processes in order to recover the process operation being necessary for the related investment in the final production line of an organization. The main aim of the present study was to recognize and make priority of the effective factors on the establishment of the same process in the Western Azerbaijan Province; for the reason, the process was carried out by the investigation of various books, articles, papers and former studies that about 57 factors were also determined by the related experts viewpoints in this regard. The statistical population of the study includes the staffs of the western Azerbaijan Province Gas Company; the number of these staffs was about 188 people. The volume of the statistical sample was estimated 121 people using Cochran formula; they were also taken up as categorization accidental sampling method. The factor analysis was also applied in order to gather the effective factors on the establishment of six-sigma; it was also carried out by a questionnaire in this case. Then it was

given into the statistical sample after measuring its validity and reliability in this study. The confirmation and discovery factor analysis was also applied in the study in order to recognize the effective factors on the establishment of six-sigma in the Gas Company of western Azerbaijan Province. The results showed that from 57 factors about 38 factors were determined being categorized into a 8 dimensions ranking in this study.

Key words: six-sigma, personal factors, managerial factors, organizational factors, cultural factors, organizational communication factors, optional and staffs factors, communicative and supervision factors

INTRODUCTION

The present changing world has made the whole industrial and service-giving organizations challenging in a bulk of complicated problems. An organization can get released of these complex problems that it can make some changes regarding to the productive and service-giving issues potentially being matched with the demand and ask of the whole consumers. In past, the production of commodity and service-based productions were carried out by people in relation to the knowledge and conscious (Asadi, 2007). In the present era, we are observing a rapid growing competence making the environments unsafe in compare to the past times. The superior technology regarding to the given productions and services has the highest potential importance in terms of its quality-based affairs. Along with the process of quality and its struggle not only it is not a benefit but also it should be assessed essentially in this pavement (Nasiripour and Mehr Alhassani, 2008). The increase of

conscious, technology, competence and increasingly grow of the social requirements are the main and crucial factors that its appearance is subjected to the whole managers and executive of private and governmental organizations; in this field the importance of the quality is appeared an essential case potentially. The process of six-sigma is being applied increasingly in the different industrial and transaction sections potentially; this can be efficient in reducing the intense process variables breaking the related rate in the whole working critical processes in order to recover the process operation regarding to the investment of the final production line of an organization (Antony, 2004). In 1960s to 1980s the methodology of TQM was carried out by zero error making interesting results in this case (Alinezhad et al, 2009). But today the factories and industrial sections have been completely competitive in giving their productions and services. These factories try to protect their

shares in the marketplace to obtain the related establishment in the same potential market but this cannot be merely enough to reach to the same market by the use of Total Quality Management (TQM) such as customer satisfaction and Cost of Poor Quality (COPQ). The technique of Six-Sigma is one of the most effective methods in applying the concepts of TQM (Saghaiee and Didekhani, 2011). The evolutionary stream of the technology in the world regarding to reach to the high-quality productions and services has made the importance and necessity of the same process inevitable in this regard. The best quality is not considered merely as a luxury case but it should be recognized in a framework fundamentally in today's competitive world in relation to the manufacturers and consumers viewpoint; it also is represented in relation to the productions and services potentially; along this the process of six-sigma is a method that has been based on the data and its purpose is to reach to the high quality case. The main case making the distinction of the six-sigma is subjected to the prevention of the mistakes before happening in a process; the process using a collection of statistical tools bringing too much benefits for an organization that it can also make durable or sustainable benefits for the Gas Company of western Azerbaijan Province

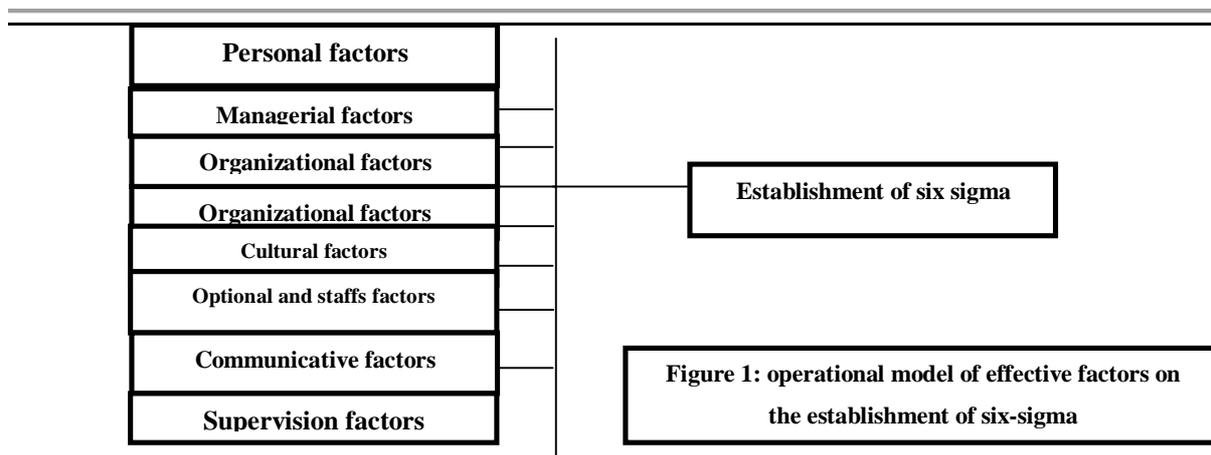
getting towards the globalization affairs potentially. This makes the same organization to determine and recognize the whole opportunities and challenges dynamically that the same organization can carry out its purposes and strategies potentially going towards an optimized future in its organizational affairs. Hence, the main question may come into the mind that if the same Gas Company is going towards the global issue, what features does it require in implementing its purposes? Along this carrying out a changing approach regarding to optimize the quality case is considered a strong tool in obtaining the high potential competitive markets in the commerce world. The six-sigma is a process that helps an organization regularly to meet the development and production issue continuously regarding to the high quality. There have been many various factors influencing on the establishment of the six-sigma process; for the reason, the main purpose of the present study is to recognize and determine the effective factors on the western Azerbaijan Province Gas Company. The six-sigma is a quantity-based method making its own effectiveness on every organization by many various incredible methods (Yang and Hish, 2009). This also makes highest profitability for the entire organizations potentially (Linderman et al, 2003). Scrooder et al (2008) not only

defined the six-sigma process and its fundamental theory including the leadership commitment, selection of strategic projects, recovery experts, construction-based method, Define, Control DMAIC, Improve, Analysis and Measure but they also state the same potential factors in the process of six-sigma. Zu (2008) believes that the six-sigma not only supports the key elements of TQM but also it has three-factors implementation case being essential for achieving the six-sigma projects success including a crucial system (champion, Master Black Belt, Black Belt and Green Belt), DMAIC and focus on the scales along with seven traditional management elements of the quality function management effectively (Zu, 2008). The process of six-sigma is a standard global system providing the customers' requirements and developing the staffs' progression potentially; this is also considered as a responsibility for the human forces not for an opportunity. The process of six-sigma has a basic difference with other quality systems traditionally and classically because the recovery of the quality can increase or decrease the expenditures; based on this basic philosophically difference, the related process has got its own approach and technique differently than others. The six-

sigma is an approach that is being conducted based on the data and its aim is to reach to the superior quality issues. The prevention of happening events is the main distinction of the six-sigma process (Beikzad and Najafi, 2011). Six-sigma is specified an innovative and regular-based activity estimating the whole causes and effects potentially. It measures the causes statistically (Kim, 2006). In the programs of six-sigma the customer satisfaction process and opposite sides are called the destructive affairs because they disagree with the customers' satisfactory affairs (Adams, 2011). The methodology of the six-sigma is applied in order to solve the problems. When the level of the six-sigma is increased, an increase happens in reducing the deficiencies potentially. Reaching to the six-sigma level is a perspective and unfortunately some companies could not reach to the optimized level of the six-sigma issues (Azer et al, 2008).

Designing operational pattern of establishing six-sigma process:

Due to the theoretical basics and data gathering method from the former studies, it can be stated that the operational model of the present study is given based on an eight dimensions model as following.



MATERIALS AND METHODS

The methodology of the present study is based on an onion model; it also is an applied purposefully regarding to discovery and descriptive methods; the research method: quantity based study; periodical horizon: mono cross section; data gathering method: descriptive (Danayieefard et al, 2004). The statistical population of the study includes the staffs of Bank Tejarat. Based on the received data from the west Azerbaijan Gas company; the number of these staffs is 188 people. Cochran equation was applied in order to measure the statistical sample volume that the number of people was estimated 121 cases in this study. The method of the research sampling is purposive sampling which gives the researchers to use their own judgments to select suitable people for the sample (Balci, 2004).

Research measuring tools and data analysis method:

A questionnaire is applied in order to gather the statistical sample responding to the research questions due to the variables

of the research and their operational issues. The questionnaire is consisted of effective factors questions on the optimization of the six-sigma in Gas Company being applied in a Likert-based five options scale framework. This section has 57 questions being determined by the investigation of many books, articles and papers as well as experts' comments in this pavement.

Validity and reliability of the research instrument:

Validity of the research instrument: The validity of the questionnaire is obtained based on the related data 0.866; this has been also obtained by the use of Cronbach's Alpha using SPSS Software.

Reliability of the questionnaire:

First, many studies have been carried out through books, articles, papers and other reliable references to clarify the complete concepts and important variables in measuring the research issues. This makes to specify the most suitable questions for the related research. After designing the questions, the preliminary questionnaire was given to the management experts and

professors to amend and confirm the final questions accurately. In this research, the descriptive and inferential statistical methods were applied to analyze the related data in the study. The descriptive statistical method was used to specify the demographical features and the inferential

method was also applied in order to analyze the data; the structural equations modeling and path analysis were also applied in this study. The related used software was SPSS17 and Lisrel8.5 for analyzing the related data in this pavement.

Table of representing the variance:

Table 1: representing the variance

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.698	31.463	10.698	4.041	11.886	11.886
2	3.745	11.015	42.479	4.028	11.848	23.734
3	2.901	8.533	51.012	3.907	11.491	35.225
4	2.107	6.072	57.208	3.230	9.500	44.725
5	1.725	5.072	62.280	2.854	8.393	53.118
6	1.346	3.958	66.238	2.457	7.226	60.344
7	1.113	3.273	69.511	2.324	6.837	67.180
8	1.022	3.007	72.518	1.815	5.338	72.518

Based on table 1, eight factors having the special coordination larger than one could be seen in this regard. Also the total variance equals 72.518%; in other words, these eight factors have about 73% of the variance explaining the related questions. The degree of total variance representation is higher than 60% in this case.

The first factors includes the organizational commitment, culture, staffs' risk ability, staffs' positive attitudes, responding temperament, experience and skill, organizational change and personal creativity that these have been called as

personal factors based on theoretical basics. The second factors are subjected to the support of top managers, job-based leadership style, humanism-based leadership style, managers' risk ability, support of managers, quality-based managers and innovation-based leadership style that these have been called as the managerial features. The third factors are related to the clear strategy for recovering the quality, holding educational courses for making staffs to get familiar with the implementation of the six-sigma approach and representation of the entire missions

and company purposes that these have been also called as the organizational factors based on theoretical basics. The fourth factors are subjected to the innovative cultures, organizational cohesion, supportive culture, organizational regularity and moral pyramid that these have been also called the cultural factors based on theoretical basics. The fifth factors are related to the staffs' partnership, organizational communication, organizational intimacy and knowledge that these have been also called the organizational communication factors based on theoretical basics. The sixth factors have been regarded to the quality system of human force management-based

issues and absorbing high potential staffs that these have been called the selection of staffs due to the theoretical basics in this regard. The seventh factors are also subjected to the facilitation of customers' requirements and making suggestive systems that these have been also called the communicative factors; the eighth factors are also related to the issues and optimizations and humanism-based leadership style that these have been also called the supervision factors based on theoretical basics.

What is the most suitable model for establishing the six-sigma in the west Azerbaijan Province in Gas Company?

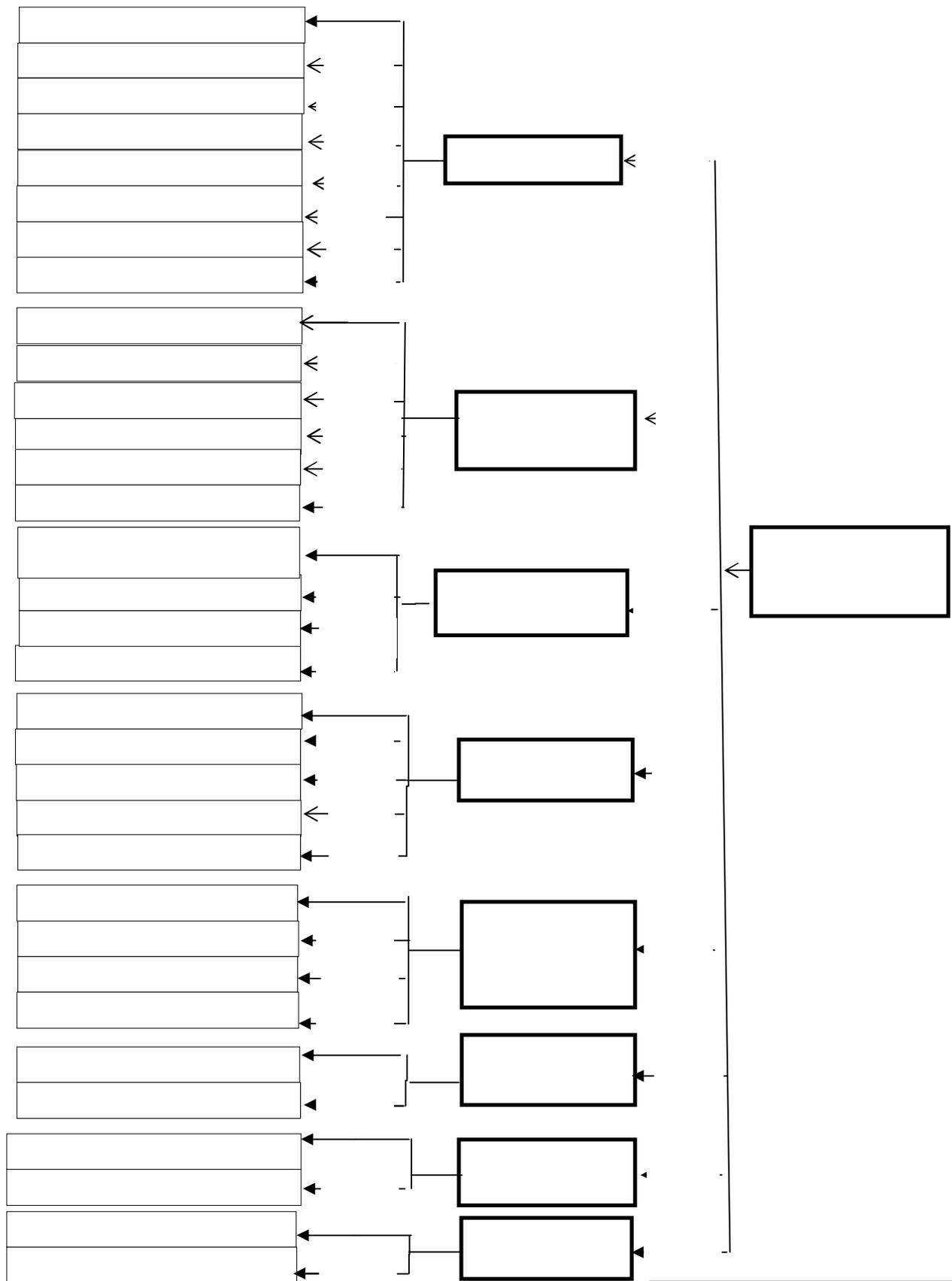


Figure 2: confirmation factor analysis of the second variable step in establishing the six-sigma based on T-value

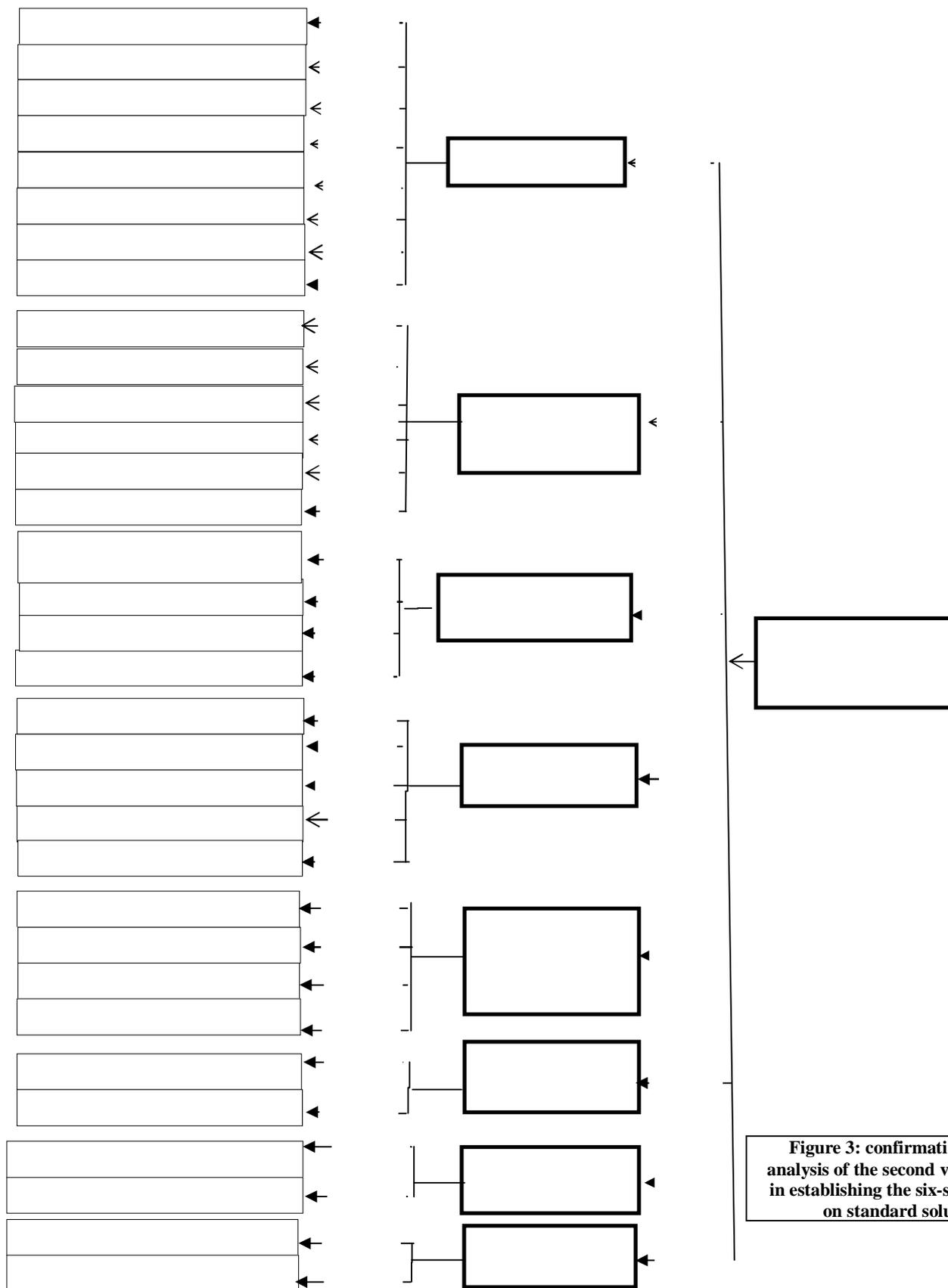


Figure 3: confirmation factor analysis of the second variable step in establishing the six-sigma based on standard solution

The factors of organizational commitment, support of top managers, clear strategy for a company in order to recover its quality, innovative culture, staffs' participation, quality of human resources, facilitation of customers' requirements and optimizations have been considered as the variables in this study and degree of T-Value has not been reported in this case. According to the

information of diagram 2, the estimated coefficients are significant in the whole paths. The standard parameter degrees being observed for every variable representing the power of the factor load over the variable and degree of T is larger than 1.96 showing its significance in this path.

Table 3: indices of good processing model of establishing the six- sigma

Khi square	DF	Sig	Root of mean approximation squares	Index of good processing	Balanced good processing
2005.26	519	0.000	0.154	0.97	0.82

The degree lower than 0.05 is represented for the index of mean squares error root and degrees higher than 0.9 show the index of good processing and balanced good processing index as the adaptation criteria model with the observed data in this case.

As a result, this model has been confirmed along with the establishment of the six-sigma and eight factors. **Making priority of eight factors on the establishment of six-sigma on the western Azerbaijan Province Gas Company:**

Table 4: results of Friedman Test regarding to the effective factors on the establishment of six-sigma in the Gas Company of Western Azerbaijan Province

Degree	Explanation
119	Number
7	Degree of freedom
0.000	Significance level

Rank	Factors	Mean rank
1	Selection of staffs	5.76
2	Supervision factors	5.10
3	Managerial features	4.86
4	Organizational communication	4.68
5	Organizational factors	4.48
6	Personal factors	3.86
7	Communicative factors	3.76
8	Cultural factors	3.47

As it shown in table 4, the degree of Friedman test is lower than 0.05 due to the significance of the test in this regard. Thus, there is a significance difference between

every eight effective factor on the establishment of the Gas Company of Western Azerbaijan Province so that the selection of staffs has the highest and the

cultural factors has the lowest impact on the establishment of the six-sigma process in Gas Company of Western Azerbaijan Province.

CONCLUSION

The distinction side of today's organizations with the early 20th century's organizations is that today's organizations make their productions consequently benefit for their own abilities and these will lead to the efficient results. The degree of organizations' success in obtaining the indices of the function (results) is determined by the comparison of the competitors. The speed and quality of these function indices in this competitive world depends on the organizational methodology in diagnosing and applying the most precise approaches in this pavement. The six-sigma is survived as innovative approaches for recovering the process of the management. Due to the obtained results from the scale of validity and confirmation, discovery factor analysis of 57 early determined factors could be seen in the Gas Company of Western Azerbaijan Province; these include personal, managerial, organizational, cultural, organizational-communicative, selection, communicative and supervision factors. In relation to the six-sigma method and its effective factors on the obtained results in this research, it is coincident with the results of Saho, Tiwary

and Milleham in 2008 titling the six-sigma as a basic approach for optimizing the blacksmith variables. Also, in relation to the six-sigma as a basic approach, it is coincident with the results of Zeghardi and Bagheri and Attarian titling the effective factors on the six-sigma projects in Iranian selected companies. The distinction between today's organizations with early 20th century companies is that they are going towards the efficient result-based consequences. The degree of organizational success is determined by obtaining the indices of the function (results). The speed and quality of reaching to the function indices depends on the organizational methodology in applying the abilities in this pavement.

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