Pathology the Causes of Delay in the Major Project's of Oil Industrial, Case Study: South Pars

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Abstract

The projects which are carried out in different fields are usually accompanied by some delay. These delays have many consequences, including extra costs and losses for interested parties. This might lead to dispute among those who are involved in the project. This article intends to identify the causes of delay in carrying out the mega project of south pars and its consequences. The reason behind the selection of this subject is the huge costs and losses which are imposed on our country following delays in carrying out oil, gas, and petrochemical projects. The main point is to predict and remove obstacles which lead to delay in projects' execution. This article emphasizes the importance of determining a time frame for projects' execution so that an appropriate economical planning can be made. Time is very important factor in executing projects and if it is not carefully assessed, it might cause some losses. The results of this study showed that the contractors have a key role in determining the time that is required for the fulfillment of a project. Thus, this article proposes that determining the criteria for contractor selection is the most important factor that affects the time needed for a project fulfillment and should be the subject of future research.

Keywords: Project- South pars- Project delay- Project beneficiaries.

Introduction

Projects that are carried out in different fields are usually accompanied by some delay. These delays have some consequences, including extra costs and losses for interested parties. This might cause some dispute among those who are involved in the project and also might lead to underachievement and loss. Thus, it is necessary to create a mechanism for identifying the causes of delay. Based on such a mechanism, the effect of the delay on different parts of the project and also its roots can be identified. This study intends to Pathology the Causes of Delay in the Major Project's of Oil Industrial.

The reason behind the selection of this subject is the huge costs and losses which are imposed on our country following delays in carrying out oil, gas, and petrochemical projects.

The main point is to predict and remove obstacles which lead to delay in projects' execution. This article emphasizes the importance of determining a time frame for projects' execution so that an appropriate economical planning can be made. Time is very important factor in executing projects and if it is not carefully assessed, it might cause some losses. The success of each project is dependent on three factors: cost, time, and quality. In other words, a project can be said to be successful if it is carried out by appropriate cost, in predetermined time, and with acceptable quality.

Goals of the study: Goal 1: Examining the role of project manager and its impact on the delay in the development of south pars gas field mega project. Goal 2: Examining the role of advisors and its impact on the delay in the development of south pars gas field mega project. Goal 3: Examining the role of contractors and its impact on the delay in the development of south pars gas field mega project. Goal 4: Examining the role of domestic manufacturers and its impact on the delay in the development of south pars gas field mega project.

Hypotheses: There is a meaningful relationship between the project managers' conduct and the delay in the development of south pars gas field mega project. There is a meaningful relationship between the advisors' conduct and the delay in the development of south pars gas field mega project. There is a meaningful relationship between the contractor's conduct and the delay in the development of south pars gas field mega project. There is a meaningful relationship between domestic manufacturers and the delay in the development of south pars gas field mega project.

Literature Review

A classification of methods for delay analysis: Methods for delay analysis can be categorized from different perspectives. Keane and Caletka categorize the methods of delay analysis into three main groups: ascending, descending, and analytic. The

Association of International Development in Engineering presents a classification of delays which has been shown in the following tree diagram. Following the diagram, some explanations have been presented[1].

Different types of delay: Delays in projects can be categorized into several groups: Excusable delays: This type of delay is beyond the control of project managers and contractors. Non excusable delays: This type of delay is the result of mistake on the part of involved entities. Each type of delay might have one of the following consequences: Amendable delay: This type of delay can be compensated during the project's execution if appropriate actions are carried out. Non amendable delay: This type of delay increases costs and reduces the revenues and the project is fulfilled at a time that its technology is outdated and cannot be amended in predicted time.

The most important factors which lead to delays and problems: Common causes of delay in projects can be categorized into two groups: uncontrollable factors (unpredictable) and controllable (predictable) (technical issues). It is obvious that indentifying predictable and technical issues is more important.

A review of related studies: A lot of studies have been conducted on this issue at the international scale, most of which have focused on construction industry.

Williams studied the methods which are carried out to find the causes of delay in projects and referred to the deficiencies of these methods[2].

In another study, the causes of delay in construction projects in Malaysia have been investigated and the importance of each factor has been explored and the relationship between these elements has been identified[3]. Castro and his colleagues[14] developed a model for identifying the causes of delay and tackling resource division problems in PERT nets projects.

A lot of studies have been conducted in the Middle East to tackle the problem of delay in projects. For instance, in a study which was conducted in Jordan, 130 projects in public sector were examined to find the causes of delay. In another study in this country, the causes of delay in construction projects have been investigated.
In another study which was conducted in Saudi Arabia, frequency of delays and the extent of their impact and also their causes in water and sewage projects have been investigated. In another study in this country, the delays caused by project managers, contractors, and advisors have been explored.
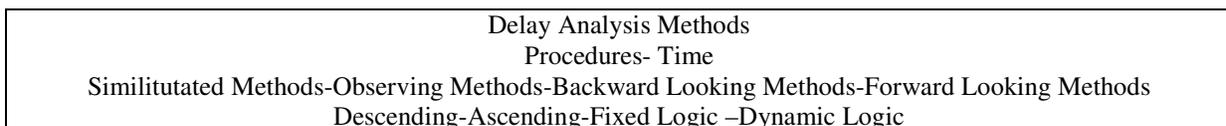
Moosavi and his colleagues[5] in an article (A Review of the Causes of Delay in Construction Projects and a Model for Shortening Delays) says that each year a huge amount of resources are spent on construction projects. Delay in construction projects is a very common problem. Thus, identifying and analyzing the causes of such delays is very important. The majority of studies which have been done to identify the causes of delay in construction projects are based on interviews with project managers. In this article, the contents of supervisory reports and the information about national construction projects and related statistics have been used and the problem of budgeting has been identified as the main reason for delay in projects. Also, regression analysis has been used to find the relationship between the predicted progress and realized progress.

Eshtehardian and his colleagues[7] in an article (A Review of Causes of Delay in Urban Construction Projects) say that delay in urban construction projects is the result of some rooted obstacles. This is a problem that seriously threatens urban development. Developing a transportation network that includes roads, bridges, and tunnels is of great importance. In this article a brief review of the causes of delay in the past projects in Iran (roads, bridges, and tunnels in Tehran) and other countries has been presented. In most cases, the project managers have been blamed for these delays. The contractors and advisors are placed in the following ranks.

Moradi in an article (An Analytic Review of Delay in Projects) says that generally projects are accompanied by some delay. These delays might cause extra costs and losses for interested parties. This might lead to a dispute among those who are involved in the project. So, it is necessary to create clear mechanisms for identifying the causes of delay. In this article, for methods are presented for analyzing delays, including: the method of comparing delayed timing with real timing, the method of adding time to predicted time, the method of deducting time from predicted time, and the method of timing impact. Having discussed each one, key and main points of success for them have been explained.

Frimpong and his colleagues examined the viewpoints of project managers, employees, advisors, and contractors in Ghana concluded that the following factors are the causes of delay in construction projects: i. Monthly payment problems on the part of organizations. Contractors managerial deficiencies. Deficiencies in technical performance. Increase of prices.

Delay Analysis Methods
Procedures- Time
Similitutated Methods-Observing Methods-Backward Looking Methods-Forward Looking Methods
Descending-Ascending-Fixed Logic –Dynamic Logic

Figure- 1
Classification of delay analysis methods

Emphasizing the effect of geographical parameters on the needed time for a project and gathering viewpoints of involved entities in Vietnam, Duy Long identified five groups of elements which might cause delay in projects. These elements are as followings[10]: Ineligibility of contractors and planners, Changing managers and inadequate predictions, Social and technical problems, Issues related to lands and buildings, Inadequate techniques and equipments.

In a study conducted in Nepal, the factors which led to delay in 22 highway projects were investigated. In this study, organizational deficiencies, failure of raw material producers, governmental regulations, and the delay in transportation system were identified as the main causes of delay in projects.

In another study conducted in Jordan, the causes of delay in construction projects were explored. Planners' deficiencies, changes caused by owners, climate and land condition, and delay in delivery, economical situation, and increase in quantity were identified to be the main causes of delay in such projects.

In Saudi Arabia, there was a positive correlation between technical ranking of contractors and the frequency of projects which were accompanied by delay[6].

In Iran, several studies have conducted to identify the causes of delay in construction projects. In one these studies, causes of delay in dam building projects was investigated by gathering the viewpoints of project managers, advisors, and contractors. This study concluded that the followings are the most important factors: . Payment for completed projects, Managing the site of the project, Approval of workshop design, Unpredictable conditions of land, Inexperienced contractors, Failure to predict costs, Lack of competent work force

The mentioned results of these studies have been presented in the following table.

Methodology

Type of the study: The current study titled "Identifying and Analyzing the Causes of Delay in the Development of the Mega Project of South Pars Gas Field and its Consequences" is an applied research whose goal is to develop the knowledge in this field and directs the researchers towards the applications. Having determined hypotheses and dependent and independent variables, this study took a deductive approach and provided a questionnaire that was answered by participants. Then, the data were analyzed by statistical procedures and the results were compared with hypotheses.

Statistical society: In this study, the statistical society includes experts, managers, executives, and advisors who were involved in this project from the beginning of the first phase in south pars until now[8].

Number of samples: In order to reduce the time needed for the research and to make it updated, a group of samples were selected. Based on these reasons, a certain method of sampling was used. In order to determine the number of samples, the following formula was used:

Table- 1
The conclusion of the studies[7]

Country and year of study	Identified elements that caused delay in the projects
Saudi Arabia-1999	Technical ranking of contractors
Jordan-2000	Planners' deficiencies, changes caused by owners- climate and land condition- delay in delivery- economical situation- increase in quantity
Jordan-2002	Project managers interference- Lack of experience of contractors-providing resources- inefficiency of work force- delay in decision making- inappropriate planning- minor contractors
Nepal-2002	organizational deficiencies- failure of raw material producers- governmental regulations- and the delay in transportation system
Ghana-2003	Monthly payment problems on the part of organizations- Contractors managerial deficiencies- Deficiencies in technical performance Increase of prices
Vietnam-200	Ineligibility of contractors and planners- Changing managers and inadequate predictions- Social and technical problems- Issues related to lands and buildings- Inadequate techniques and equipments
Iran-2006	Payment for completed projects- Managing the site of the project- Approval of workshop design- Unpredictable conditions of land- Inexperienced contractors- Failure to predict costs- Lack of competent work force-
Malaysia-2007	Inappropriate planning on the part of contractor- Inefficient management of contractor on the site of project- Inexperienced contractors- The failure of customers to pay after completion- Minor contractors' problems- Lack of raw materials- Providing work force- Lack of access to equipments- Lack of appropriate communication between involved parties in the project- Mistakes in constructional operations

$$n = \frac{N \cdot t_{\frac{\alpha}{2}}^2 \cdot \sigma^2}{Nd^2 + t_{\frac{\alpha}{2}}^2 \cdot \sigma^2}$$

Where: n= the number of samples, N= the number of statistical society, $t_{\frac{\alpha}{2}}$ = the obtained value from normal distribution tables (t-student) based on standard error of measurement ($t_{\frac{\alpha}{2}}$) in the right series and a degree of freedom equal to n-1, σ^2= the obtained variance from analysis of preliminary society, d= the maximum of error.

After using the above formula on preliminary group, variance was calculated and considering d=%5, a group of was selected that included 33 participants.

Materials for gathering data: In this study, a questionnaire with Likert scale (5 scales from very high to very low) was used. In this questionnaire, the participants were asked to express their views on some issues.

The questionnaires were sent to participants through post, Email, fax, or were handed to them directly.

Validity and reliability of the questionnaire: Validity means that the used material is measuring the targeted characteristics and nothing else. Reliability means consistency and dependability. If you give the same material to the same participants on two different occasions, the same results will be obtained[9].

The validity of the questionnaire was checked by some experienced experts.

The preliminary questionnaire consisted of 54 questions. These questionnaires were given randomly to 17 subjects. The collected data were fed into SPSS software.

A reliability of 0.72 was calculated by Cronbach Alpha formula. Considering that a reliability of above 0.70 is acceptable, it can be said that the questionnaire enjoyed an appropriate reliability.

The Cronbach α coefficient was calculated by following formula:

$$\alpha = \frac{j}{j-1}\left(1 - \frac{\sum_j S_j^2}{S^2}\right)$$

Where: J=the number of questions, S_j^2=variance of subtest, S^2= variance of the whole of the test, Number of cases=17 Number of items= 54, Alpha=0.720

Study variables: In this study, the needed time for project was dependent variable and the followings items were independent variables: -The employer's conduct, -The project's advisors conduct, -The project's contractors conduct, -The domestic manufacturers' conduct, -Descriptive statistics for the first part of the questionnaire, Before analyzing the data, some characteristics of the subjects were obtained by the data from the questionnaire. In table 2, the percentages of frequency have been presented for subjects. 12.2 percent were advisors, 21.21 percent were contractors, and 66.67 percent were project managers.

Testing research hypotheses: As mentioned earlier, statistical society consisted of 35 subjects and the sample group consisted of 33 subjects who were selected by mentioned sampling procedures. After checking the validity and reliability of the questionnaire, they were distributed among the 33 participants and all of them (%100) were collected. SPSS software was used to analyze the data gathered by the questionnaires. In order to test the 8 hypotheses of the study, the main hypotheses were tested by t-student test. H_1 was the hypothesis claimed by the researcher and H_0 was the contradictory hypothesis. Then, the data gathered by the questionnaires and related values were extracted from t-student table. The results for testing seven hypotheses have been presented in table 4 and then each one will be analyzed separately[10].

Hypothesis number one: Based on this hypothesis, there is a meaningful relationship between the performance of employer and the time needed for the completion of south pars mega project.

Table -2
Frequency distribution in terms of different factors

Factor	Frequency	Percentage
Advisor	4	12.12
contractor	7	21.21
Project manager	22	66.67
total	33	100

Table-3
Frequency distribution in terms of degree of education

Education	Advisor		Contractor		Project manager		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
BA	2	50	4	57.14	5	22.73	11	33.34
MA	1	25	3	42.86	8	36.37	12	36.36
PhD	1	25	0	0	9	40.90	10	30.30
total	4	100	7	100	22	100	33	100

Table-4
Data gathered for testing 4 hypotheses

	First hypothesis	**Second hypothesis**	**Third hypothesis**	**Fourth hypothsis**
Number of data	33	32	32	33
mean	3.787	3.772	4.02	3.89
Standard deviation	0.374	0.602	0.644	0.719
Skewdness (sk)	0.029	0.038	-1.584	-1.110
Lower level	3.111	2.8	1.812	1.5
Higher level	4.518	5	5	5

H_0= There is no meaningful relationship between the performance of project manager and the time needed to complete the development of south pars mega project.

H_1= there is a meaningful relationship between the performance of the employer and the time needed for the completion of south pars mega project.

In other words, the hypothesis H_0 states that $\mu_x < \mu_0$

The hypothesis H_1 states that $\mu_x > \mu_0$

Based on table 3, the mean is 3.787 and a standard deviation of 0.374. According to this statistics, t is equal to 19.775 and the degree of freedom is 32. Level of meaningfulness (p-value) is 0.00. Thus, with a probability of %95, H_0 hypothesis is rejected and the hypothesis H_1 is supported. The results are presented in table 4.

$$t = \frac{\bar{x} - \mu}{S/\sqrt{N}}$$

Where: μ= 2.5, (Mean) $\bar{x}$ =3.787, (Standard deviation) S=0.374, n=33, (Degree of freedom) n-1=32,

$$t = \frac{3.787 - 2.5}{0.374 / \sqrt{33}} = 19.775$$

The t table shows that α= 0.025, d_f =32, and t=1.960. Considering that the obtained t from the formula was 19.775, the H_0 is rejected and H_1 is proved.

Based on the data illustrated in figure 2 and the data in table 5 in which SK=0.029(in the first hypothesis), smaller values have a higher frequency. Considering that 1 SKl<0.10, the distribution is approximately normal. Considering the mean, this statistical is ranked in the third place among the 8 hypothesis[11].

Histogram
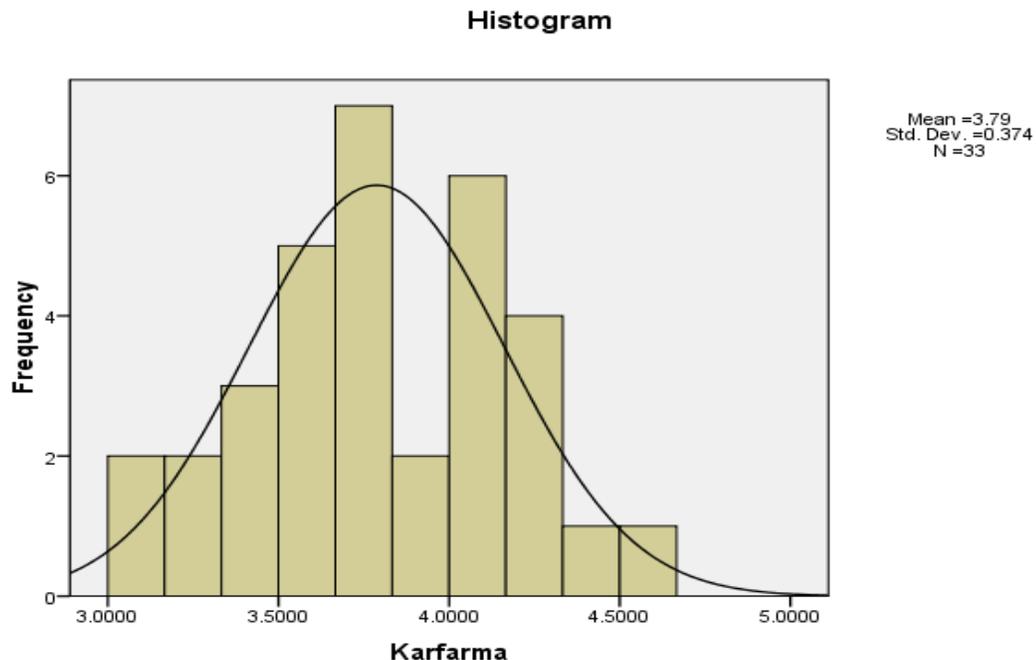
Figure-2
The index of first hypothesis

This is consistent with the researcher's claim that the employer's performance or conduct is correlated with the time needed to develop the mega project of south pars gas field. These results were based on questions No. 1 to 27 which emphasizes the importance of the role of employer. Also, the deficiency of banking regulations and the persistence of projects' managers to provide the needed resources and credits are crucial factors that affect the time for projects' completion. Frequency distribution and factors related to the employer which affect timing have been presented in table-6[12].

Hypothesis number two: Based on this hypothesis, there is a meaningful relationship between the performance (conduct) of advisors and the time needed to complete the mega project of south pars gas field.

H_0= There is no meaningful relationship between the performance (conduct) of advisors and the time needed to complete the mega project of south pars gas field.

H_1= There is a meaningful relationship between the performance (conduct) of advisors and the time needed to complete the mega project of south pars gas field. Looking at table 4, you will find that the mean is 3.772, standard deviation is 0.602, t is 11.947, degree of freedom (d_f) is 31 and the level of meaningfulness is 0.00. Thus, H_0 is rejected by a

Confidence of %95 and the claim made by the researcher (that there is a relationship between the performance of advisors and the time needed to complete the mega project of south pars gas field) is supported. The results have been shown in table-7.

$$t = \frac{\bar{x} - \mu}{S/\sqrt{N}}$$

μ= 2.5

Where: (Mean) $\bar{x}$=3.772, (Standard deviation) S=0.602, n=32, (Degree of freedom) n-1=3

$$t = \frac{3.772 - 2.5}{0.602/\sqrt{32}} = 11.947$$

If you look at the figure 3, you will see that Skewdness (sk) is equal to 0.038 which shows that lower values have higher frequency. l sk l <0.10, so distribution is normal.

So, the researcher's claim that there is a correlation between advisor engineers performance(conduct) and the time needed for the mega project of south pars gas field development is approved.

The related questions in the questionnaire were items 28 to 32. From these data, it becomes clear that the inexperienced advisory firms have the greatest impact on the length of the time that is needed for the project. Also, from this hypothesis it can be proved that lack of supervision (on the work of experts) on the part of advisor managers is another factor that leads to delay in projects. This problem can be solved by employing expert and experienced work force and by creating a mechanism for motivating these personnel[13].

Hypothesis number three: According to this hypothesis, there is a meaningful relationship between the main contractor's performance (conduct) and the time needed for the mega project of south pars gas field development.

H_0= There is no meaningful relationship between the main contractor's performance (conduct) and the time needed for the mega project of south pars gas field development.

H_1= There is a meaningful relationship between the main contractor's performance (conduct) and the time needed for the mega project of south pars gas field development[14].

As you can see in table 4, the mean is equal to 4.02, standard deviation is 0.644, t is 13.374, and the level of meaningfulness is 0.00. Thus, H_0 is rejected by a confidence of %95 and the claim made by the researcher (that there is a relationship between the main contractor's performance and the time needed to complete the mega project of south pars gas field) is supported. The results have been shown in table-9.

$$t = \frac{\bar{x} - \mu}{S/\sqrt{N}}$$

Where: μ= 2.5, (Mean) $\bar{x}$=4.02, (standard deviation) S=0.644 n=32. (degree of freedom) n-1=31

$$t = \frac{4.02 - 2.5}{0.644/\sqrt{32}} = 13.374$$

Based on the data of table 3 and the skewdness which is equal to -1.584, and considering that lSK l>0.5, it becomes clear that the distribution is not normal. Also, SK is negative, so the frequency of larger values is higher.

It should be noted that among the eight hypotheses, this one has the highest mean and it has the maximum impact on the time of the project.

Table -5
Testing the first hypothesis of the study

Mean	Standard deviation	Number of data	t	Degree of freedom(d_f)	Level of meaningfulness P-value
3.787	0.374	33	19.775	32	0.00

Table-6
Frequency distribution and the impact of factors related to projects' manager

	Factors affecting the time of the project	Very low	Low	Middle	High	Very high	Percentage of influence
1	Correlation between project manager's conduct and the timing						
1-1	The way main contractors are selected in consortium	0	1	4	10	16	%4.04
1-2	Number and the combination of contractor consortium	0	1	7	12	11	%3.80
1-3	Having executive experience (for project's chief manager)	1	2	6	14	10	%3.89
1-4	Managerial capability and experience of planners (employers)	0	1	6	10	16	%4.22
1-5	The ability of projects' managers in timely decision-making	0	3	6	12	12	%3.98
1-6	The apprehension of projects' managers for being questioned by supervisory bodies because of going beyond the defined responsibilities	1	2	6	12	11	%3.80
1-7	Bureaucracy	0	1	12	12	7	%3.65
1-8	Communication and organizational coordination	0	3	9	16	5	%3.68
1-9	The matrix structure of projects' managers conduct (performance)	0	6	10	13	3	%3.29
1-10	Persistency of projects' managers to provide the needed resources and credits	0	2	6	12	13	%4.07
1-11	Severe regulations for technical contracts	3	5	12	10	3	%3.14
1-12	Paying a lot of attention to the quality of project execution compared to the time	3	6	14	9	1	%2.96
1-13	The limitation of the number of manufacturers who are approved by the projects' managers	0	2	10	16	5	%3.71
1-14	The length of the time that is needed for the new manufacturers to be approved by the projects' managers	0	2	14	11	6	%3.63
1-15	Unnaturalness of the length of the time asked by the projects' managers	0	1	4	21	7	%4.01
1-16	Nongovernmental projects' managers and governmental contractors	3	7	4	10	7	%3.14
1-17	The culture of managerial works in the country and its direct and indirect influence on the whole aspects of project	0	1	9	11	12	%4.01
1-18	Meticulous supervision of project manager on contractors	2	5	10	11	5	%3.23
1-19	The deficiency of projects' managers to provide equipments	2	6	12	8	5	%3.23
1-20	The priorities preferred by the projects' managers in assigning resources	1	0	9	17	6	%3.80
1-21	Principled examination of the ability of contractors by the projects' managers	0	2	6	12	12	%3.92
1-22	The inefficiency of planners who have been chosen by projects' managers	2	1	10	11	9	%3.71
1-23	The ability of projects' managers to do different projects simultaneously	1	3	5	14	10	%%3.86
1-24	Unreal evaluation of the capacities in the country in different fields	1	2	5	12	10	%3.56
1-25	Inconsistency in bureaucracy between governmental and non-governmental organizations such as the shares in profits and losses	0	2	4	17	10	%4.04
1-26	The inability of banking system and its regulations to provide the credits	0	1	2	12	16	%4.10
1-27	The unnaturalness of the estimated costs by the projects' managers in contract	1	4	10	12	5	%3.38

Histogram
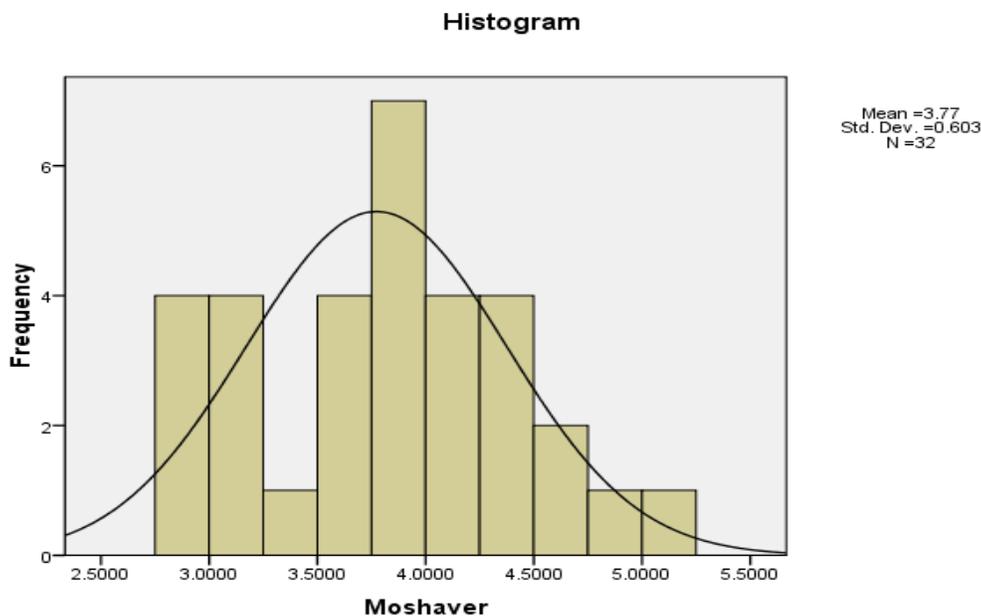
Figure -3
Index of second hypothesis

Table -7
Testing the second hypothesis

Mean	Standard deviation	Number of data	t	Degree of freedom	Level of meaningfulness P-value
3.772	0.602	32	11.947	31	0,00

Table-8
Frequency distribution and the impact of factors related to advisors

| Factors affecting the time of the project		Very low	Low	Middle	High	Very high	Percentage of influence
2	**The relationship between advisor engineers and the time of the project**						
2-1	Lack of supervision on the part of advisor managers	0	3	8	16	5	%20.00
2-2	Lack of experience in doing similar projects	0	1	5	19	7	%21.51
2-3	Lack of experience among the work force of advisory firms	0	1	7	18	6	%21.01
2-4	Lack of supervision (on the work of advisors) on the part of EPC contractor	0	3	9	12	7	%19.50
2-5	Lack of coordination between different sections of advisory firms	0	2	15	12	2	%17.98

Based on the researcher's claim that there is a meaningful relationship the main contractor's performance (conduct) and the needed for the project (questions 33 to 48), it becomes clear that the experience of main contractors is one of the factors which impacts on the time of the project. Also, this hypothesis emphasizes the point that contractors appropriate planning based on priorities and critical timing program must be taken into account by main contractors.

The financial inability of consortium members is another factor which impacts on the timing of the project. Lack of competent project managers among the contractors can be added to the mentioned factors which affect the time of the project[15].

Hypothesis number four: His hypothesis states that domestic manufacturers affect the time that is needed for mega project of south pars gas field development.

H_0= There is no meaningful relationship between domestic manufacturers' performance (conduct) and the time needed for the mega project of south pars gas field development.

H_1= There is a meaningful relationship between domestic manufacturers' performance (conduct) and the time needed for the mega project of south pars gas field development.
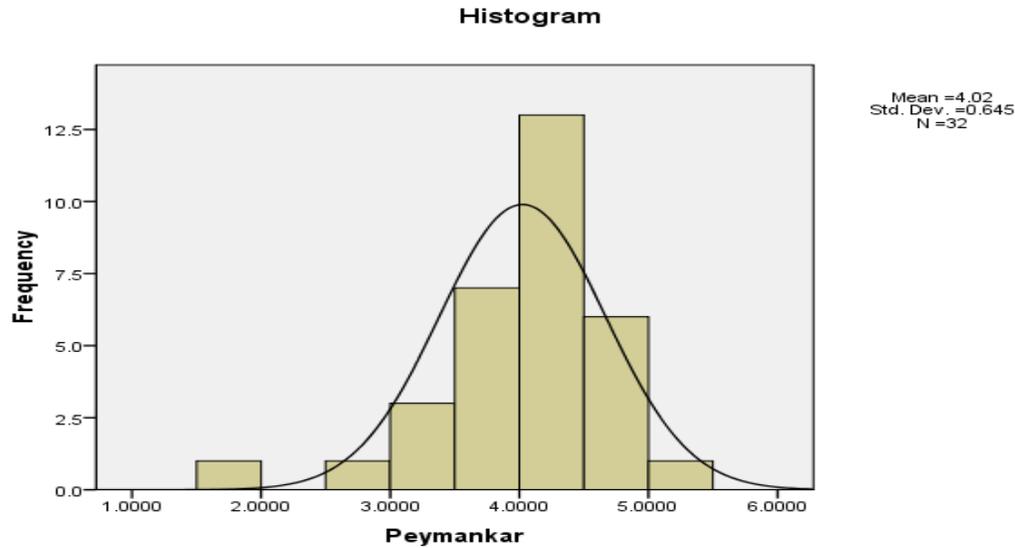
Figure -4
The index of the third hypothesis

Based on the data in table 4, the mean is equal to 3.89, standard deviation is 0.719, t is equal to 11.136, degree of freedom is 32, and level of meaningfulness is 0.00. Thus, the hypothesis H_0 is rejected by a confidence of %95 and H_1 is approved. The results are seen in table-11.

$$t = \frac{\overline{x} - \mu}{S/\sqrt{N}}$$

$\mu = 2.5$

Where: (Mean) $\overline{x}$ =3.89, S=0.719, n=33, (degree of freedom) n-1=32

Based on figure 5and the skewdness derived from table 4 (SK=-1/110), it becomes clear that because 1 SK l>0.50, the distribution is not normal. The frequency of larger values is higher. Thus, the participants who answered the questionnaire believed that the doestic manufacturers have a great influence on the time of project.

The mentioned hypothesis emphasizes this point that the timing of goods and equipment delivery is one of the most important factors that must be observed by domestic manufacturers. Also, the financial ability of domestic manufacturers is very important in order to cope with the increase in prices. Another crucial point which affects the timing of the project is the ability to provide raw materials used for manufacturing.

$$t = \frac{3.89 - 2.5}{0.719/\sqrt{33}} = 11.136$$

Reviewing factors related

Reviewing factors related to the employer: Among factors related to the employer, managerial capability and the experience of project managers had a share of 4.22 percent, which was the highest.

%4.10 of respondents to the questionnaire believed that the failure of banking regulations was the most important factor which impacts on the timing of the project. If you look at the value of SKewdness and the histogram, you will find that the distribution is normal.

Governmental contractors of phases and their bureaucracy and inconsistency with private companies (in terms of shares in profit and losses, etc. were commonly considered to be the fourth important factor. Their percentage was % 4.04.

Proposals for the impact of employer performance (conduct): Considering the importance of managerial capability and the experience of project managers, a system for choosing managers must be made in which the most experienced and competent managers are selected for high managerial positions. The ability for planning and high logical talent are two crucial factors for the managers who are in the position of employer.

Table- 9
Hypothesis number three

Mean	Standard deviation	Number of data	t	Degree of freedom	Level of meaningfulness d_f
0.00	31	13.374	32	0.644	4.02

Table-10
Frequency distribution and the impact of factors related to the main contractors

| Factors affecting the time of the project		Very low	Low	Middle	High	Very high	Percentage of influence
3	**The relationship between main contractor's performance (conduct) and time of the project**						
3-1	The degree of experience of contractor	1	1	1	11	18	%6.87
3-2	The condition of shareholders (governmental or private sector)	0	3	6	9	14	%6.38
3-3	The degree of authority given to the main contractor	1	5	4	11	9	%5.50
3-4	The competence of contractor project manager	0	1	4	16	11	%6.53
3-5	The degree of ability of contractor's work force	0	1	9	17	5	%5.99
3-6	Financial ability of consortium members	0	1	2	14	14	%6.58
3-7	The ability of project managers in consortium	0	3	4	10	15	%6.53
3-8	The capability of contractor's equipments and machineries	2	3	8	10	9	%5.74
3-9	The compatibility between the contractor's organization and the contract	0	4	3	11	14	%6.43
3-10	Commitment to the contract	1	2	0	15	14	%6.62
3-11	Choosing competent second-hand contractors	0	2	6	18	6	%6.08
3-12	Choosing competent second-hand manufacturers	0	2	6	17	7	%6.13
3-13	Providing the equipments and reducing the risk of the lack of equipments	0	2	4	13	12	%6.28
3-14	The ways that financial resources are spent by contractor and preventing the waste of financial resources	0	2	5	10	15	%6.58
3-15	Appropriate planning by the contractor based on priorities and critical timing program	1	2	3	9	17	%6.62
3-16	The persistent presence of project manager at the site of different sections, including advisor engineer office, manufacturing sites, drilling rig, maritime yard, and land workshop	1	4	12	10	4	%5.15

Table-11
Testing the fourth hypothesis

Mean	Standard deviation	Number of data	t	Degree of freedom	Level of meaningfulness (P-value)
3.89	0.719	33	11.36	32	0.000

Table -12
Frequency distribution and the impact of factors related to the main contractors

Factors affecting the time of the project		Very low	Low	Middle	High	Very high	Percentage of influence
4	The relationship between the performance (conduct) of domestic manufacturers and timing of the project						
4.1	Observing the required quality and standards mentioned in the contract	1	3	14	11	3	%14.17
4.2	The ability to provide raw materials for manufacturing	0	2	7	13	11	%17.32
4.3	Having enough experience and knowledge in order to the commitments	1	2	8	10	12	%16.93
4.4	Observing the time mentioned in the contract to deliver goods and equipments	0	3	2	12	16	%18.37
4.5	Commitments to other duties mentioned in the contract	1	4	6	13	8	%15.62
4.6	Financial ability of domestic manufacturers	1	1	5	14	12	%17.59
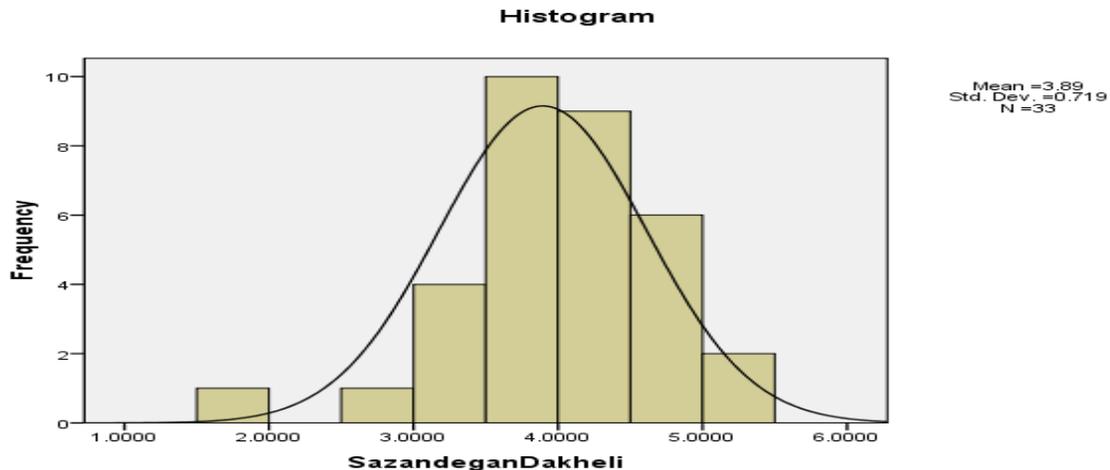
Figure-5
Frequency distribution and the factors related to the domestic manufacturers

Decision-making can be defined as the way that someone intentionally acts in some way or chooses a certain direction based on the goal that has been determined. Newman says that the quality of management is dependent on the quality of decision-making and claims that decision-making is the most important duty of the managers, because the quality and effectiveness of plans and strategies are dependent on their decisions. Wrong decision might be the result of mistake on the part of the decision-maker or might be the result of lacking knowledge or information. There is no doubt that the ability of an organization to do its duty is dependent on the quality of decisions and the quality of decisions is dependent on the information on which the decisions have been based. Thus, the project managers should be informed about all aspects of the project, including regulations, contracts, technical and economical issues, and also the policies and affaires of the country. To make a decision, the managers must consider all aspects so that they make the best decision in the right time.

The governmental employers must know that if the selection of main contractors in consortium is not done appropriately, a lot of delay might occur in the project. Thus, the managers must use different methods to select the best contractors[16].

Reviewing factors related to the advisor: Propositions related to the impact of advisor performance (conduct): As it was mentioned in the second section of theoretical principles of the study, managing activities, coordination, and cooperation have a great impact on the time, cost, and quality of the project. Among these factors, predicting the needed time and costs by the advisor and coordination and cooperation have a determining role. Therefore, the following proposals are presented:

To get an estimation of the costs and time of the project, the advisors should consult the expert and experienced personnel. By consulting, the probability of error in decision-making comes down.

Because this project is a national project and whole of the country will benefit, it is suggested that in some cases, when there is a lack of domestic expertise, reputable foreign advisory companies are employed to prevent wasting of national wealth.

To get an estimation of costs and time, employers and advisors should use the experience and documents of similar projects and observe them in their decisions. Naturally projects differ from each other in various aspects, but similar operations can be separated and used while taking the local conditions into account.

Reviewing factors related contractor: Among the factors related to the contractor, past experience of the contractor was considered to have the greatest impact with a percentage of percent6.87. Lack of appropriate planning for the costs based on priorities and critical route for timing was in the second place with a percentage of 6.62. The respondents believed that these factors have the greatest impact on the timing of the project.

Also, it became clear that the frequency of larger values was greater and %76 of respondent chose values that were larger than normal values.

Financial inability of consortium members, the methods of spending by the contractor, and wasting of financial resources with a percentage of 6.58 were commonly in the fourth place among the factors related to contractor. Also, the value of SK shows that the tendency is toward the larger values.

Reviewing factors related to domestic manufacturers: Observing the timing of the plan for delivering the goods and equipments had a percentage of 18.37 was considered to be the most important factor among the factors related to domestic manufacturers.

% 36.4 percent of respondents chose *high* option and %48.5 chose very high option.

Also, the distribution of data shows that the frequency of larger data is higher and % 68.9 of respondent chose values that were larger than normal values.

Financial inability with a percentage of percent 17.6 was in the second place among the factors related to domestic manufacturers.

As the SK value and histogram showed, the tendency is toward the larger values.

Proposals related to the impact manufacturers performance (conduct): Regarding the limitations of production capacity among domestic manufacturers, it is suggested that the ground be prepared and suitable tariffs be determined for products that can be produced in the country. This prepares the ground for domestic manufacturers to compete with foreign producers and to increase their production capacity.

Conclusion

In this article, all of the four hypothesis of the study were proved with a confidence of %95 and all of them were considered to influence the time of the project.

Based on a comparison between the means, these hypotheses can be ranked according to the degree of influence of each group of factors (from the maximum amount of influence to the minimum amount of influence):

Contractors' performance (conduct) has the greatest influence on the timing of mega project of south pars gas pars gas field development. The performance (conduct) of domestic manufacturers is in the second place in terms of affecting the time of the project. The performance (conduct) of employer is in the third place in terms of affecting the time of the project. The performance (conduct) of advisor is in the fourth place in terms of affecting the time of the project.

Suggestions for future research: In this article, the most important factors that impact on the timing of south pars gas field development were investigated and the degree of each one's impact was investigated.

Based on the results of this study, the performance (conduct) of contractor is the most important factor. Therefore, it is suggested determining the criteria for contractors' selection is the subject for future research.

In addition, the managerial capability and experience of project managers and employers is very important issue which must be met in future research.

Reference

1. Hooman Haidarali, Understanding the Scientific Method in the Behavioral Sciences, Tehran **, (2000)**

2. Hooshmand M., Seyyed Agha Hosseini S.M. and Rajabzadeh Moghani N., Oil Rents, Institutions and Financial Development: Case Study of selected Oil Exporting Countries, *Res. J. Recent Sci.,* **2(12),** 100-108 **(2013)**

3. Srinivas Mondam., Srikanth Babu V., Raviendra Kumar B. and Jalaja Prakash, A Comparative Study of Proprioceptive Exercises versus Conventional Training Program on Osteoarthritis of Knee, *Res. J. Recent Sci.,* **1(12),** 31-35 **(2012)**

4. Momeni Adel Azar, Statistics and its Applications in Management, Tehran**, (2003)**

5. Moosavi and Associates, Study of delay in construction projects of national, Fifth International Conference on Project Management, Tehran, **(2009)**

6. Moradi, Analysis methods of delayed in projects, Sixth International Conference of Project Management, Tehran, **(2010)**

7. Eshtehardian and Associates, Causes of delay time for urban development projects according to the project factors, Sixth International Conference of Project Management, Tehran, **(2010)**

8. Assessing Extension of Time delays on major projects. Williams, Terry. 1, UK: *International Journal of Project Management,* **21 (2008)**

9. Sambasivan Murali, Causes and effects of delays in Malaysian construction industry, 5, Malaysia: Sambasivan, **25, (2007)**

10. Reza zadeh E, Gholipour Y, Dam surveyors, A survey was carried out to identify and evaluate the causes of delay in large dam construction project in Iran, Tehran : International Water Power and Dam Construction, **(2006)**

11. Keane P.J. and Caletka A.F., Delay Analysis in Construction Contracts : Wiley-Blackwell, September 15, **(2008)**

12. A study on project success factors in large construction projects in Vietnam, Long Duy, Hochiminh City, Vietnam : Engineering, Construction and Architectural Management-Emerald Publishing Limited, **11, (2004)**

13. Frimpong Yaw, Causes of delay and cost overruns in construction of groundwater projects in developing countries: Ghana as a case study, 5, S, l, *Journal of Project Management,* **21, (2009)**

14. A polynomial rule for the problem of sharing delay costs in PERT networks, Castro, Javier, 7, Madrid, Spain : Computers and Operations Research, **35, (2008)**

15. Al-Momani, Construction delay : A quantitative analysis, 1, Jordan, *International Journal of Project Management,* **18 (2000)**

16. Delay in public utility projects in Saudi Arabia, Al-Khalil, 2, Saudi Arabia, *International Journal of Project Management,* **17, (1999)**

17. Bhattacharya Anjanabha B. and Davey Micheal R., Genetic Manipulation of Gibberellin (GA) Oxidase Genes in Nicotiana sylvestris using constitutive promoter to modify Plant Architecture, *Res. J. Recent Sci.,* **1(5), 1-7 (2012)**

18. Dev Nikhil, Attri Rajesh, Mittal Vijay, Kumar Sandeep, Mohit, Satyapal and Kumar Pardeep, Strategic Supply Chain Management: Perception versus Reality, A Review *Res. J. Recent Sci.,* **1(5),** 83-86 **(2012)**