

Studying Impact Level of Integration Management Standard (IMS) on Performance of National Oil Products Distribution Company of Lorestan

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Abstract

Purpose: *Determining impact level of integration management standard (IMS) on performance of National Oil Products Distribution Company of Lorestan in three oil depots located at Khoramabad, Boroujerd and Azna cities and headquarters of these three areas.*

Research methodology: *The present survey was conducted using descriptive-field method. Hypotheses were examined using researcher self-made questionnaire. Moreover, respondents answered questions before and after integration management standard (IMS). Thus it has ordinal scale along with two dependent groups that the most appropriate statistical test for such conditions is Wilkason signed rank (sign test). This test shows whether there is a difference between two groups in terms of the variable under study.*

Findings: *Given to the accomplished survey and studying all ten secondary hypotheses using statistical test of sign rank (Wilkason) average amount of performance rank for the time before IMS was equal to 118.0519 and it was equal to 202.9221 for the time after it. Therefore, it could be stated that there is a difference between average amount of performance rank before and after IMS.*

Conclusion: *Integration management standard (IMS) has been leaded to increase performance in Lorestan area. Proving all ten secondary hypotheses confirms this result.*

Introduction

Quality, safety and environmental management is a philosophical-managerial viewpoint which opens its place in the societies with an increasing speed and considering customers' needs and initiatives, methods of service offering and quality improvement are regarded as its principles. Enhancement systems of quality, safety and environmental management have been changed rapidly during recent years. Quality control methods completed or replaced simple inspection activities since two previous decades. Representing models and theories related to improving quality of products and services is the current slogan of the organizations. Therefore, quality management has become important recently in Iran as well. Manufacturing or service units desire to offer products with better quality than before. Ever-increasing advances in knowledge, skill, technology and competition in quality and trying to obtain comprehensive quality management has reached Iran as well.

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Every now and then we read or hear that a big factory or a small manufacturing or service unit has obtained certificate of one of ISO9000² series standards successfully. Given the physical structure of National Oil Products Distribution Company in Lorestan and existence of reserve tanks of oil products and flammability of such products, it became necessary to establish integrated management system (IMS) in it. Integrated management system (IMS) in Lorestan is active in the following three dimensions:

1- Quality dimension based on quality management standard ISO9001 (2000)

Three major purposes are followed in quality dimension: 1- customer satisfaction, 2- quality assurance, 3- continuous improvement

2- Environmental dimension based on environmental management standard ISO14001 (2004)

In this dimension the organization intends to evaluate its environmental performance based on environmental reviews or audits.

3- Safety dimension and professional hygiene based on OHSAS 18001 (1999) standard

According to this standard the organization tries to make the environment secure for employees, customers, contractors and beneficiaries by identifying risk centers and event factors. Collection of these three dimensions constitutes extensive world of IMS. Important changes have been created in the above organization by establishment of this system which replaced old methods in 2003. Evidences reveal that a special order dominated working methods and main processes of the organization by establishment of this system and legitimacy and systematicity found their place in this organization. But a number of managers and employees of this area still believe that it is only an additional expense. The present survey has been conducted to accept or reject such ideas so that it would be possible to judge or make decision about the above standard better.

Research literature

Quality management system based on ISO9001:2000 standard

Set of ISO9000 standards were created in 1987. This set with similar principles define required elements for having an effective quality management system. a company with more competitive power through establishment of an efficient management system is the major message of ISO9000 standards. International standard institute in Genoa, Switzerland is the main center of ISO. Today it has been proved that having ISO9000 certificate would be the essential condition for successful presence of manufacturing, economic and service institutions. Not only big companies but also smaller and moderate institutions can enhance their market share in the global markets by receiving ISO9000 certificate or be in the status of superior supplier. Although we cannot say that any company or institution with such certificate has the most superior and best services but through achieving such standard many inter-organizational problems could be solved, quality of services would increased and finally more customers would be attracted to the organization.

Reviewing environmental management system based on ISO14001:2004 standard

Environment of each organization constitutes its major body. Organization has no without paying attention to its environment. Inattention of managers to the environment will be leaded to bad consequences for the organization. Thus this topic has been regarded among one of the most important managerial subjects courses in the framework of environmental management system. On the other side, necessity of scientific recognition of characteristics and hazards of oil products that are distributed by National Oil Products Distribution Company and used by consumers in different industrial, domestic, business, agriculture and transportation sectors is clear to all. Vapors arising from discharging and loading of oil products especially gasoline, spilling because of discharging and loading of products, existence of MTBE that is a very dangerous material as gasoline additive, the smoke from tankers' exhaust inside of oil depots and many other pollutant factors have made establishment of environmental management system ISO14001 necessary.

²International Standard Organization

Reviewing safety management system and professional hygiene based on OHSAS 18001:1999 standard

Many events were occurred after the industrial revolution which had too many financial and human losses. Handicaps, disabilities and mortalities in the past in factories, industries and workshops show nonobservance of rules and regulations of this standard. Chernobyl disaster in atomic reactors and terrible event of Bupal in India due to leakage of poisonous gas are among the unforgettable events which were led to death of thousands of people. Therefore, occurrence of such events was the starting point of moving towards OHSAS 18001 standard. Since unexpected events are occurred in units covered by the Oil Ministry like refineries and various petrochemicals, establishment of this system seems necessary. This standard was in 1999 and it is about ten years that is used in our country's industries to prevent many events or accident.

Research background

Esfahani (2006) studied the relationship between applying principles of comprehensive quality management and effectiveness of employees in Iran's Industrial Development and Renovation Organization in his M.A thesis. The researcher concludes in his primary hypothesis that there is a significant relationship between applying principles of comprehensive quality management and effectiveness of human force given to significance level 0.001 that is less than 0.05. Also he claimed in his first secondary hypothesis that comprehensive quality management in the intended organization was led to creativity and innovation.

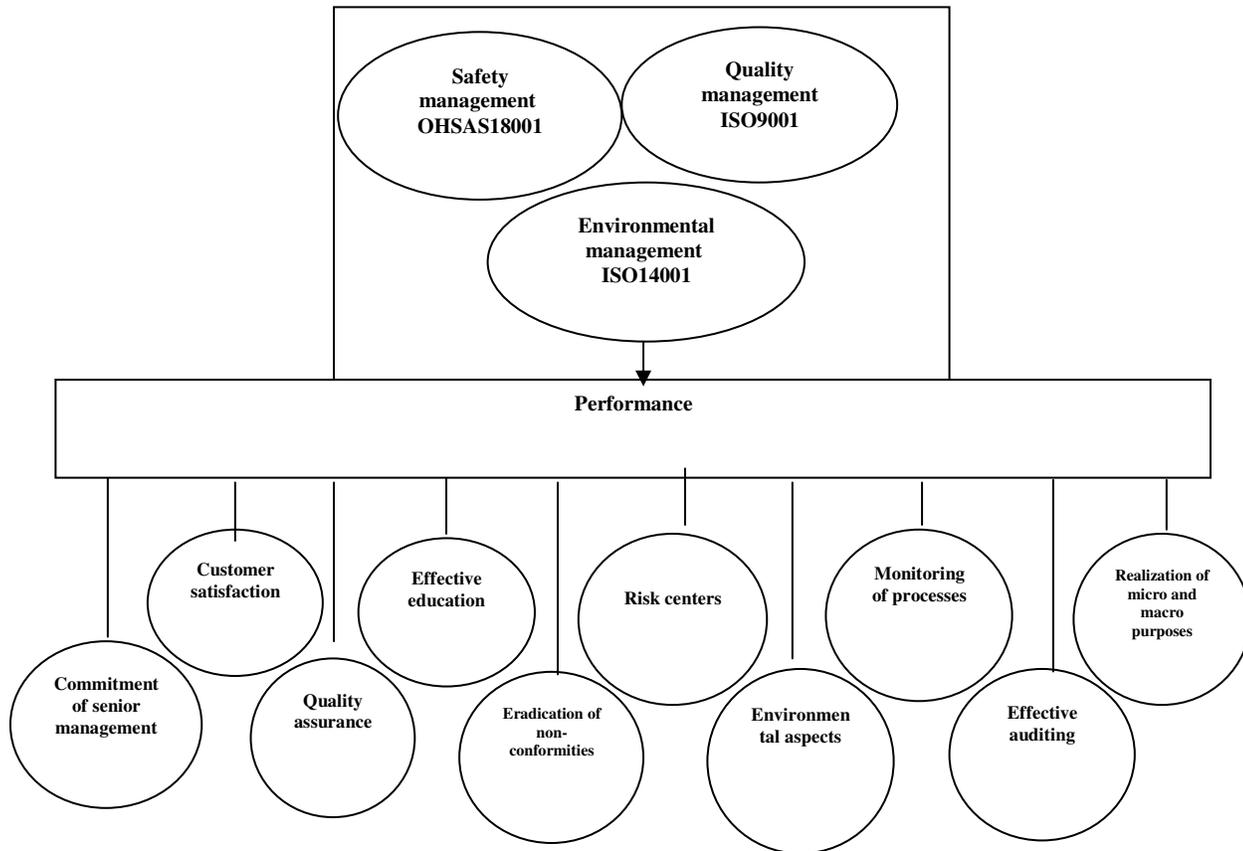
Mirzaee (2003) in his M.A thesis entitled "impact of quality management on performance of Khorasan Petrochemicals Paksan Company" studied ten elements of quality measurement indexes and concluded that applying principles of quality management increased productivity level up to 21%.

Borna (2006) studied Khoramabad Social Security Hospital . In her M.A thesis for two time periods before and after establishment of quality management system ISO9000:2000. She confirmed her hypotheses and concluded that establishment of this system decreases waiting time to discharge patients and drug delivery from the drugstore. Finally, according to her establishment of such system is useful and she believes that quality management system improves hygiene and environmental status inside the sections as well.

Mollamotalebi (2006) considered impacts of implementing ISO9000 on customers' complaints through analysis of complaints in Electricity Distribution Company in Ghazvin province in his M.A thesis. Null hypothesis was rejected in all trends of research and the significant relationship among establishment of quality assurance system and complaints due to mistakes in bills, lighting of roads, accidents and events was confirmed. This study indicates that sum of complaints represented to the Electricity Distribution Company has been reduced considerably during this period, thus the researcher evaluates its impact positive.

Jacop M. Rasmussen (2007) studied integrated management system (IMS) in Danish companies in his M.A thesis. The researcher provided some explanations in this regard while representing a diagram from reporting structure. In addition to these models he referred to IMS matrix in the form of a table in which some paragraphs of management system standards are illustrated. Also he talked about ISO9000 standard, SMO and EFQM models and other hybrid models in his study that quality assurance is one of their important purposes.

Operational model of research



Source: (ISO14001:1997)

Research hypotheses

Primary hypothesis:

Integration management standard (IMS) increases performance of the oil company in Lorestan province.

Secondary hypotheses:

Secondary hypotheses 1: Integration management standard (IMS) increases commitment of the senior management in Lorestan province.

Secondary hypotheses 2: Setting of integration management standard (IMS) increases customers' satisfaction.

Secondary hypotheses 3: Setting of integration management standard (IMS) increases quality assurance of products and services.

Secondary hypotheses 4: : Setting of integration management standard (IMS) increases effectiveness of personnel training and beneficiary parties.

Secondary hypotheses 5: : Setting of integration management standard (IMS) eradicates nonconformities and reduces them across the area.

Secondary hypotheses 6: : Setting of integration management standard (IMS) is led to identify risk centers (RPNs) and decrease events.

Secondary hypotheses 7: : Setting of integration management standard (IMS) causes to identify and decrease environmental aspects.

Secondary hypotheses 8: there is a direct relationship between: Setting integration management standard (IMS) and monitoring of the organization's processes.

Secondary hypotheses 9: It is possible to enhance effectiveness of internal audits across the area by setting of integration management standard (IMS) tool.

Secondary hypotheses 10: there is a direct relationship between Setting of integration management standard (IMS) and realization of micro and macro purposes.

Implementation of research

This survey is applied in terms of purpose and it is cross-sectional in terms of time horizon. It is descriptive-field type which has been conducted in National Oil Products Distribution Company in Lorestan. Three oil depots located at Khoramabad, Boroujerd and Azna cities and headquarters of these three areas were also studied.

Statistical population of the survey included one-hundred managers, assistant directors, directors of regions and experts who dealt with this standard directly. In other words they were present in two time periods before and after execution of this standard in the organizations. The same method was used for the customers. Number of customers who dealt with these organizations every day and were present before and after execution of the system and have already participated in various kinds of works hops or educational classes is equal to eighty persons. Most customers of these organizations were individuals like drivers of tankers, some sellers and branch owners who dealt with the organization every day. From one hundred employees, eighty persons were selected for statistical population of employees in the organizations under study. Sixty-six persons were selected from eighty customers as the statistical sample volume by referring to the table (Talkman, Morgan). Therefore, eighty questionnaires were distributed among employees and sixty-six questionnaires were distributed among customers that seventy seven of employees and sixty three of customers responded the designed questions. Only three persons from each group didn't respond to the questions. Eighty questionnaires were distributed among employees and sixty-six questionnaires were distributed among customers in order to determine reliability and their cronbach alpha was calculated through SPSS software after collecting the questionnaires. As it is observed in the below table cronbach alpha showed number of 0.735 after IMS and 0.924 before IMS.

In order to study the hypotheses given that researcher self-made questionnaire was used and respondents answered both questions before and after IMS applying, thus there is ordinal scale along with two dependent groups. The most appropriate statistical test for such survey is statistical test of Wilkason signed rank (sign test). Wilkason statistical test is the most common non-parametric test to show the difference between two paired samples which has a relative high power and exists in many computer software. This test indicates whether there is a difference between two groups in terms of the variable under study.

Analysis of hypotheses

Secondary hypothesis one:

Null hypothesis H_0 : integration management standard (IMS) doesn't increase commitment of the senior management in Lorestan province.

Descriptive statistics table of the first hypothesis

	Number	Mean	Standard deviation	Minimum	Maximum
Commitment-after	77	18.7273	1.2736	15.00	20.00
Commitment-before	77	11.8701	1.7423	6.00	15.00

Test statistic of the first hypothesis

Commitment-before/commitment-after	
-7.565	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than $\alpha=0.05$ null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between commitment level of senior management before and after IMS.

Secondary hypothesis two:

Null hypothesis H_0 : integration management standard (IMS) doesn't increase customers' satisfaction.

Descriptive statistics table of the second hypothesis

	Number	Mean	Standard deviation	Minimum	Maximum
Customer satisfaction- after	63	18.9048	1.3645	12.00	20.00
Customer satisfaction- before	63	12.8413	1.3703	9.00	16.00

Test statistic of the second hypothesis

Customer satisfaction-before and customer satisfaction-after	
-6.890	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between satisfaction level of customers before and after IMS.

Secondary hypothesis three:

Null hypothesis H_0 : integration management standard (IMS) doesn't increase quality assurance of products and services.

Descriptive statistics table of the third hypothesis

	Number	Mean	Standard deviation	Minimum	Maximum
Quality-after	77	18.0649	1.0174	16.00	20.00
Quality-before	77	11.1299	1.5841	8.00	18.00

Test statistic of the third hypothesis

Quality before- quality after	
-7.673	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between quality of offered products and services before and after IMS.

Secondary hypothesis four:

Null hypothesis H_0 : integration management standard (IMS) doesn't increase effectiveness of personnel training and beneficiaries' plans.

Descriptive statistics table of the fourth hypothesis

	Number	Mean	Standard deviation	Minimum	Maximum
Education-after	77	23.4805	1.1310	20.00	25.00
Education-before	77	13.5455	2.1247	8.00	21.00

Test statistic of the fourth hypothesis

education-before/education-after	
-7.651	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between educational effectiveness before and after IMS.

Secondary hypothesis five:

Null hypothesis H_0 : integrated management standard (IMS) doesn't eradicate nonconformities and reduce them across the area.

Descriptive statistics table of the fifth hypothesis

	<i>Number</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Nonconformity-after	77	17.9091	0.9203	15.00	19.00
Nonconformity-before	77	9.4805	2.2397	4.00	15.00

Test statistic of the fifth hypothesis

Nonconformity-before/nonconformity-after	
-7.650	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between eradication of nonconformities and reduction of them before and after IMS.

Secondary hypothesis six:

Null hypothesis H_0 : integration management standard (IMS) is not leded to identify risk centers (RPNs) and decrease events.

Descriptive statistics table of the sixth hypothesis

	<i>Number</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Risk centers-after	77	23.1688	1.3219	19.00	25.00
Risk centers-before	77	14.2857	1.7611	10.00	20.00

Test statistic of the sixth hypothesis

Identifying risk centers-before/ Identifying risk centers-after	
-7.647	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between identification of risk centers before and after IMS.

Secondary hypothesis seven:

Null hypothesis H_0 : integration management standard (IMS) is not leded to identify and decrease environmental aspects.

Descriptive statistics table of the seventh hypothesis

	<i>Number</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Environment-before	77	18.5714	1.0936	14.00	20.00
Environment-after	77	10.9481	1.6772	8.00	18.00

Test statistic of the seventh hypothesis

Identifying and reducing environmental aspects-before/Identifying and reducing environmental aspects-after	
-7.664	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between identification of environmental aspects and reduction of them before and after IMS.

Secondary hypothesis eight:

Null hypothesis H_0 : there is no direct relationship between integration management standard (IMS) and monitoring of the organization's processes.

Descriptive statistics table of the eighth hypothesis

	<i>Number</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Monitoring-before	77	18.0649	0.9366	15.00	20.00
Monitoring-after	77	8.0649	2.0859	4.00	15.00

Test statistic of the eighth hypothesis

Monitoring of processes-before/ Monitoring of processes-after	
-7.609	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between monitoring of processes before and after IMS.

Secondary hypothesis nine:

Null hypothesis H_0 : it is not possible to enhance effectiveness of internal audits across the area by integration management standard (IMS).

Descriptive statistics table of the ninth hypothesis

	<i>Number</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Auditing-before	77	23.3636	1.2556	19.00	25.00
Auditing-after	77	12.4286	1.2909	6.00	19.00

Test statistic of the ninth hypothesis

Effectiveness of audits-before/ Effectiveness of audits-after	
-7.638	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between conducted audits before and after IMS.

Secondary hypothesis ten:

Null hypothesis H_0 : there is no direct relationship between integration management standard (IMS) and realization of micro and macro purposes.

Descriptive statistics table of the tenth hypothesis

	<i>Number</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Purposes-before	77	22.8182	1.2001	17.00	25.00
Proposes-after	77	13.2338	2.0059	6.00	19.00

Test statistic of the tenth hypothesis

Recognition of micro and macro purposes-before/Recognition of micro and macro purposes-after	
-7.656	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between realization of micro and macro purposes before and after IMS.

Primary hypothesis

Null hypothesis H_0 : integration management standard (IMS) doesn't increase performance of the oil company in Lorestan province.

Descriptive statistics of the primary hypothesis

	<i>Number</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Performance-before	77	202.9221	6.0017	18.00	213.00
Performance-after	77	118.0519	13.1047	89.00	172.00

Test statistic of the main hypothesis

Performance-before/Performance-after	
-7.626	Amount of Z
0.005	Significance level

According to above table given that significance level (0.005) is lower than α -0.05 null hypothesis is rejected and alternative hypothesis is confirmed. So we can claim that there is a difference between performance of Lorestan Oil Company before and after IMS.

Discussion and conclusion

Implementation of integration management standard (IMS) has been led to increase commitment of senior management in Lorestan province. Also satisfaction level of customers in this company has been much increased as a result of IMS establishment. Conducted studies on documents and records show appreciation and thankfulness of many customers confirm this issue and increases quality of offered services and products than before. Calibration of devices and equipments, continuous monitoring of quality control unit and operation of the depot on type of the transmitted product, customers' awareness from quality of purchased products and responsiveness to internal and external auditors are reasons against this claim. It is possible to enhance educational effectiveness for employees and beneficiaries by applying integration management standard (IMS). On the other side, Esfahani's thesis entitled the relationship between applying principles of comprehensive quality management and effectiveness of employees in Iran's Industrial Development and Renovation Organization confirms this result as well, because human resources education is a very important factor that leads to effectiveness of human resources.

This system gives rise to eradicate nonconformities and reduce them across the organization. Borna's study that is in consistent with the present survey strengthens this result, since she has concluded that quality management systems in Khoramabad Social Security Hospital improves many of the existing nonconformities in this hospital like waiting time of the patient for examination, operational surgery, discharge and drug delivery from the drugstore and etc. Implementaion of integration management standard (IMS) system especially observance of the safety system and professional hygiene (OHSHS18001) is resulted in identification of risk centers (RPNs) and reduction of accident. This conclusion is reinforced more in Jacop M. Rasmussen's study in Danish companies and his integrated diagram. This system is led to identify environmental aspects and reduces them. Identifying more than 80 to 100 cases of environmental aspects across this region confirms this result. Observing rules and regulations of ISO14001 was led to select Oil Company of Borojerd region in 2009 in terms of the environment as the sample oil depot (green area).

Also it could be said that there exists a direct relationship between application of IMS standard and monitoring of organizational processes. Existence and importance of this system has been led to conduct 430 monitoring for different activities across the region among which 150 cases are related to Khoramabad region, 140 cases are related to Borojerd region and other 140 cases are related to Azna region which has been effective in most cases. It is possible to enhance effectiveness of internal audits through integration management standard (IMS) across the region. Training more than 20 employees of this region as internal auditors of system and performing internal auditing for fourteen times and external auditing for seven times by German DQS companies and URS of England indicate such effectiveness. Finally it could be stated that it is possible to identify micro and macro purposes of various units by this system at the beginning of each year and announce them to the management representative for approval which are proposed in management reviewing session in order to be approved. Then it is planned to execute them and are announced to the related units.

Main hypothesis: by studying and confirming all of ten secondary hypotheses using statistical test of sign rank (Wilcoxon) and mean difference of performance rank for the time before and after IMS we can conclude that implementation of integration management standard (IMS) has been led to increase performance in Lorestan province. Proving all secondary hypotheses confirms this conclusion as well. Mirzaee's research result is another reason for this confirmation. In his M.A thesis entitled "impact of quality management on performance of Khorasan Petrochemicals Paksan Company" he studied ten elements of quality measurement index and concluded that applying quality management principles increases productivity level of this company up to 21 percent.

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