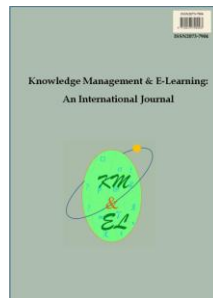

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Effects of knowledge management strategy and organizational learning capability on innovation-driven performance in an oil company

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Abstract: The purpose of this study is to investigate the effects of knowledge management strategy and organizational learning capability on organizational performance with an emphasis on organizational innovation. The participants of the study include top, operational, and intermediate managers of an oil company. A 5-point Likert scale questionnaire was developed and used to collect data from 161 managers. Confirmatory factor analysis, correlation test, and path analysis were used for analysis. The results showed that knowledge management strategy has a positive and meaningful effect on organizational innovation and that innovation has a positive, direct and meaningful effect on organizational performance. However, organizational learning capacity does not have a meaningful relationship with organizational innovation.

Keywords: Knowledge management strategy; Organizational learning capacity; Innovation; Performance; Pars oil and gas company (POGC)

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1. Introduction

Pars Oil and Gas Company (POGC), a subsidiary of National Iranian Oil Company (NIOC), was established in 1998. POGC utilizing modern management knowledge, tools and techniques as well as experienced seasoned managers, specialists and experts in the execution of oil and gas projects, has thus far taken major steps in the realization of NIOC's objectives. However, acquiring localized knowledge and modern technologies for the development of oil and gas fields are of issues, which have not received enough attention since its establishment and this has led into prolonged interruptions in field developments and shipping activities. This is why we can consider innovation and proper use of knowledge as important and necessary issues for this company.

Abrupt changes in knowledge and the special approach toward knowledge management can be discussed under the umbrella term of knowledge dynamics. The dynamics of knowledge can be created by investment in research, training, development, creativity, transmission, transformation, and knowledge application (Shafiei Nikabadi, Feizy, Olfat, & Taghavi Fard, 2013). As the very existence of knowledge is important for organizations, they try to develop various strategies to create organizational knowledge through strengthening the knowledge of the employees. Nowadays, knowledge is considered as a strategic approach in creation of competitive advantage (Asgarian, 2012). On the other hand, knowledge can be a facilitative element in value creation (Chen, Lin, & Chang, 2009). However, mere knowledge cannot provide the above-mentioned advantages and is in need of management. Knowledge management has introduced itself as a fundamental necessity in today's age. Of major reasons behind this need, we can consider increasing global competition, high speed in knowledge documentation, dynamics of product and process innovation, and high level of competition in sales markets (Greiner, Böhmman, & Krcmar, 2007). If we are going to approach the knowledge management, effectively, we should develop appropriate strategies with regard to the intended organization and knowledge we have. Implementation of knowledge management strategy can show its efficiency in different ways such as (1) reducing the time required for different tasks, (2) reducing the repetitions in doing tasks, (3) improving the quality and consistency of decisions, (4) improving the efficiency of organizational tasks, and (5) job satisfaction and facilitation. Researchers in the field of knowledge management have claimed that knowledge management has a positive relationship with organizational performance (Bogner & Bansal, 2007). We can consider learning, of other effective factors on performance. We can consider learning as the only competitive advantage for the future companies. In order to facilitate learning in our organizations we need some preliminaries called organizational learning capability. Such preliminaries play an important role in maintenance and efficient performance of an organization (Camps, Alegre, & Torres, 2011). One other important and efficient variable that affects the organizational performance enhancement is organizational innovation (Goh, 2003). In an organization, innovation can play a significant role in providing opportunities to grow, and in surpassing its rivals (Sáenz, Aramburu, & Rivera, 2009). In general, it can be argued that in order to achieve a higher level of innovation, organizations should try to create knowledge, as well as, making the best use of the existing knowledge.

Consequently, this study investigates the effective factors on appropriate implementation of such strategies with regard to the importance of organizational performance and innovation in organizations. With respect to the review of related

literature, the researchers noticed that there is a plethora of studies on the existing relationships among knowledge management strategies, innovation, and performance as well as the relationships among organizational learning capacities, innovation, and performance but few studies covered both above-mentioned fields of study in one model. Hence, we are to study the relationships among the above-mentioned variables as well as the degree of influence of knowledge management strategy and organizational learning on organizational innovation and organizational performance in POGC.

2. Literature review

2.1. Knowledge management strategy

Many researchers believe that tacit knowledge to incomplete knowledge flow (Pourzolfaghar, Ibrahim, Abdullah, Mariah Adam, & Abdullah Abang Ali, 2013). Knowledge has been considered as an important source of competitive advantage and value creation as well as an essential element for sustainable development and generally as a determining factor for organizations that have global passions. For organizations, an environment of continuous change positions knowledge as the source of key competitive advantage and simultaneously mediates change to more fluid structures. More flexible structures challenge the traditions of knowledge flowing through hierarchical and formal chains of command. The emerging more fluid and knowledge based organizational structures present new challenges for developing, retaining and disseminating organizational knowledge (Barratt-Pugh, Kennett, & Bahn, 2013). In addition, the knowledge which is identified by organizations is a dynamic source which is in need of management and reinforcements (Mirfakhrodiny, Hatamy Nasab, Taleie Far, & Konjkave Monfared, 2011). Knowledge management is one of the main competitive sources for every organization so that many believe that the more an organization acquires the knowledge and puts it into practice, the more it succeeds (Shafiei Nikabadi, 2013). Despite the importance of knowledge management in organizations, few researches have been allocated to such issues and as Shafiei Nikabadi and Zamanloo (2012) have claimed, the reason behind such negligence is “the difficulty of measurement of knowledge value and knowledge management system in industrial and economical institutes”. Knowledge management is the process of gathering, organizing, and storing the expertise and organizational experiences from different sources and then transmitting them to the corresponding sections that lead to improvement in performance and perception of staffs in different rankings, causes more income and finally yet importantly helps the organization to create value (Nonaka, 1994). Knowledge management is the process of acquiring information through various ways in order to use it immediately and extensively. Indeed, knowledge management is an attempt to provide appropriate knowledge, in appropriate time, and appropriate situation. Many organizations have established some sort of knowledge management strategy in an attempt to structure and support knowledge sharing across the internal and external organization. Yet, in practice many companies fail in ensuring a continuous focus on knowledge sharing, the full integration of knowledge management strategies and on continuously developing knowledge culture (Aagaard, 2013). Knowledge management strategies are high-level organizational programs, which are designed to provide necessary knowledge and expertise in line with the mission and outlook of the organization. Such programs provide a framework in which organizations can investigate the new ways of applying knowledge management. Moreover, such knowledge management strategies provide the necessary

knowledge management processes for an efficient action in this regard (Choi & Jong, 2012).

On the other hand, knowledge management strategy can be considered as the process of production, encryption, and transmission of explicit knowledge into tacit knowledge, as well as, providing appropriate knowledge for appropriate person and in appropriate time and place (Halawi, McCarthy, & Aronson, 2006). Scholars have proposed different aspects for knowledge management strategy. They can be categorized based on two key dimensions: 1.KM focus 2.KM source. On the first dimension, KM strategies are explicit-oriented and tacit-oriented strategy. Explicit-oriented (codification) strategy codifies and reuses knowledge to increase organizational efficiencies. This strategy has been performed by some IT tools such as: decision-support system tools, Group ware, document repositories etc. (Shafiei Nikabadi, 2013). Tacit-oriented (personalization) strategy is based on direct person-to-person and is performed through socialization processes. The second dimension can be classified as internal and External-orientation. External-oriented strategy acquires the knowledge from outside sources. On the other hand internal-oriented strategy focuses on generating and sharing knowledge from inside of the organization. Almost every researches use KM focus as the study dimension. This dimension tested in many researches and has been reliable. In addition, because of organization's nature as a project-oriented company, reusing the information of previous projects is very necessary. Therefore, applying this dimension is logic. Two aspects of this dimension which are used in this study are encryption (codification) and personalization. The notions are going to be explained below.

Encryption strategy has a “people-documented” approach, which includes protected explicit knowledge and is designed in the form of database in order to be in touch and used by others. Encryption strategy can be a good storage mechanism for a large amount of organizational memory (Boh, 2007). Personalization strategy is based on a “people-people” approach that delivers customized services, which are often applied by the organizations, and provides customized solutions to specific problems. This strategy focuses mostly on the discussion among people, rather than the existing knowledge in database. The purpose of this strategy is to acquire and transmit the knowledge through knowledge networks such as associations. If the business focuses on the creation of new or customer-based solutions or is looking for innovation in productive processes, personalization strategy is superior to encryption strategy (Greiner, Böhmman, & Kremer, 2007).

2.2. Organizational learning capacity

The notion of organizational learning capacity focuses on the facilitative factors of learning in organizations. Organizational learning has a role in survival of the organization and its success in competition with other organizations. Learning is considered as a potential to achieve the competitive advantage. The scholars in this field agree that organizational learning is a complicated and multi-dimensional concept and for this reason, finding a unique definition which is largely accepted by everyone in this field is so difficult (Hajipour & Nazarpour Kashani, 2011). Organizational leaning capacity can be the potential of an organization in different components of knowledge processes such as creation, acquisition, transmission, and uniformity of knowledge (Gomez, Cespedes-Lorente, & Valle-Cabreva, 2005). It can be generally argued that organizational learning capacity focuses on the importance of facilitators for organizational learning. Such facilitators traditionally were determined via organizational learning and learning organizations. In the review of related literature, a collection of

activities were stated that grantee the organizational learning capacity. This is possible through efficient creation of ideas which is done through applying a set of activities such as experimentation, continuous improvement and teamwork, participative problem solving and observing other's behaviors, and participative decision-making (Alegre & Chiva, 2008). Chiva, Alegre, and Lapiedra (2007), with regard to the previous works, has identifies the shaping factors of organizational learning capacity and classified them in five groups which are explained below.

Dialogue: which is a component of organizational learning capacity that encourages the interaction among members and stimulates the groups and teams to share their results.

Risk taking: Researcher has approached this component as a probability or a non-constructive result that occurs based on different activities. Risk taking is an organizational reaction that quit the organization out of its usual path and leads it to the unknown places (Venkatraman, 1989).

Experimentation: organizational experimentation is a way of experimental learning that strengthens the organizations in the case of learning from experiences and knowledge as well as letting them know about the deployment of new knowledge. Accepting new ideas, coming from inside or outside of the organization, with open arms may support the experimentation (Hasan, 2010).

Participative decision-making: it takes place when employees have a significant impact on the outcome of decisions (French, Israel, & As, 1960).

Interaction with the external environment: the more organizations interact with each other (with external shareholders of the organization), the more probable is the creation of knowledge and enhancement in products (Choi & Jong, 2012).

2.3. Organizational innovation

The concept of innovation has attracted the attention of many researchers. this notion has been first proposed by Schumpeter (1934) as the process of creating new commercial brand, productions, services, and processes; and the effect of which on economic growth. Afterwards, numerous researchers have proposed various definitions of innovation for long-term survival of organizations; and innovation was considered as an important factor in organizations (Khan, Rehman, & Fatima, 2009). Baregheh, Rowley, and Sambrook (2009) believe that innovation is the process of creating new knowledge and ideas for internal business and pulls the market toward productions and services. Innovation is the process of putting our thoughts and ideas in practice, as a result of creativity (Moradi, Yakide, Abdollahiyan, & Safardoost, 2013). Innovation is a fundamental tool for growth strategies and entering the new markets, which is applied for increasing the present market share of the organization and sustaining the organization in the current competitive era (Gunday, Ulusoy, Kilic, & Alpkan, 2011). Innovation can be considered as a structured and knowledge-based activity, which covers the organizational boundaries using networks (Wang & Wang, 2012). So far, it can be inferred that a variable, such as innovation, can be interpreted differently based on the situation. Therefore, various aspects can be considered for innovation such as product, process, and administrative, technical, and managerial innovation. It is clear that we cannot cover all aspects in our study, for example, administrative or product innovation, because of the nature of the company, cannot be applied in POGC. For this, only managerial and process innovations are covered in this research.

Process innovation

Process innovation provides a tool for sustaining and enhancing the quality as well as saving costs, and includes adoption of new and enhanced methods of production, distribution, and delivering services. In fact, it refers to the degree that organizations adopt new technologies and put the new methods of doing jobs into experiment (Mirkamali & Choupani, 2012).

Managerial innovation

This type of innovation attempts to make changes in organizational structure and management processes such as staff employment, distribution of resources, task structuring, and authorization and rewards. This happens when an organization accepts innovation, and implements new methods for distribution of responsibilities and decision-makings among its staffs and managers. One example that we can use in this context is the implementation of an organizational model, which focuses on the integration of knowledge management activities in the organization (Damanpour, 1992).

2.4. Organizational performance

The topic of performance evaluation is a widespread issue, which is affected by a range of fields and experts and a lot of new Reports and articles have been written about it. Moreover, the application market in this context has grown steadily. Despite numerous models and frameworks in this context, conceptual models of some researchers have had a great effect on shaping this specific field (Seyed Naghavi, Sepandarnd, & Ramin Mehr, 2013). However, in order for the performance evaluation models to be investigated, a definition of which is necessary. Performance evaluation is “the process of quantification of efficiency and effectiveness of operations” (Chen, Zhu, & Xie, 2004). As in investigation of performance evaluation, two aspects of it are under investigation, financial and non-financial (Kaplan & Norton, 1996), we can consider two aspects for the evaluation of variable of performance as financial and non-financial. In financial aspect, just financial issues are under investigation such as return on investment (ROI), return on assets, and other financial ratios. Nevertheless, in non-financial aspect, managerial and behavioral issues are under investigation. Covering both aspects, in this study, researchers have considered three aspects to evaluate the performance.

Financial performance: in order to assess this aspect, this study used the average growth in profits, turnover of the organization, ROI, and growth rate in sales (Wang & Wang, 2012).

Human relation model result: this aspect of performance includes actions that contribute to the human resources of the organization such as turnover and absenteeism (Quinn & Rohrbaugh, 1983).

Operational performance: this aspect focuses on production and corresponding operations (Wang & Wang, 2012).

3. Development of hypothesis

3.1. Knowledge management and organizational innovation

Knowledge sharing barriers reduce the propensity of individuals to share knowledge and produce innovation behavior (Yeşil & Hırlak, 2013). Parlbay and Taylor (2000) believe that knowledge management supports innovation, new idea creation, and harnessing the power of organizational thought. Investigations have shown that knowledge management has an important role in innovation processes through establishing a useful and valuable culture and sharing knowledge and cooperation inside the organization. Researchers have emphasized the central role of knowledge management, especially in establishing an internal atmosphere inside the organization that supports innovation. Researchers have claimed that there is a meaningful and positive relationship between knowledge management in organizations (Jiang & Li, 2009). Wang and Wang (2012) administered a research entitled “knowledge sharing, innovation, and performance of the company” in which it was concluded that sharing tacit and explicit knowledge facilitates innovation and performance. In addition, it was found that sharing explicit knowledge has a more significant effect on the rate of innovation and innovative performance. A research was done by Liao (2011) entitled “the effect of knowledge management and organizational structure on innovation” and he concluded that knowledge management and organizational structure can facilitate innovation and that knowledge management has a positive and meaningful effect on innovation. Consequently, based on literature review just mentioned the following hypothesis is developed:

***Hypothesis 1:** knowledge management has a positive, direct, and meaningful effect on organizational innovation*

3.2. Organizational learning and organizational innovation

Numerous studies showed that those cultures that strengthen organizational learning cause an improvement in individual, team, and organizational learning. As a result, organization’s performance will be improved (Egan, Yang, & Bartlett, 2004). From organizational learning viewpoint, consistent output of created capacities by knowledge causes innovation performance and its improvement. As a result, Innovation is usually created by the generated knowledge from research and development departments (R&D) and other relevant departments. Organization’s internal information is increased, absorbed and mixed by the learning capability of staff. Also it causes an improvement in the organization's capabilities for learning and reinforcement of the performance of innovative activities and also creation of innovative potential and the effectiveness of innovative activities. Rothaermel and Deeds (2004) showed that organizational learning which is created by external connection with workmates and partners is effective for the improvement of new goods and innovation. Chang and Lee (2010) in their research entitled “organizational learning capacity and organizational innovation: the mediating role of knowledge” tried to investigate and analyze the relationship between organizational learning and innovation. The results revealed that organizational learning capacities have a positive and meaningful relationship with organizational innovation. On the other words, organizational learning capacity is one of the fundamental, vital, and facilitative factors for organizations which lead to growth and innovation. Therefore, the development of the culture of learning among members of the organization would lead to the creation and sustenance of knowledge systems as well as new and creative ideas in organization, which consequently leads to organizational innovation.

Hypothesis 2: *Organizational learning has a positive, direct, and meaningful effect on organizational innovation*

3.3. Innovation and organizational performance

Rosenbusch, Brinckmann, and Bausch (2011) conducted a research under the title of "is innovation profitable?" The purpose of this study was to obtain evidence on the issue that under which circumstances the small companies with limit resources can benefit from innovation. The findings showed that the relationship between innovation and performance is under the influence of contextual factors such as age of the company, type of the innovation, and cultural factors. García-Morales, Loréns-Montes, and Verdú-Jover (2008) also conducted a research under the title of "The Effects of Transformational Leadership on Organizational Performance Based on Learning Level in Pharmaceutical Companies" which was based on the collected data from 164 pharmaceutical companies. A global model was developed and tested through structural equation modeling. The results indicated that there is a positive relationship between innovation and performance. In addition, it was claimed that the model works better on the organizations with more powerful organizational learning.

Hypothesis 3: *Organizational innovation has a positive, direct, and meaningful effect on organizational performance*

3.4. Knowledge management strategy, innovation, and performance

For sustained performance in a dynamic market environment, individuals within an organization must operate in a social network (SN) that promotes knowledge exchanges, encourages knowledge acquisition, and facilitates dissemination of domain knowledge pertinent to the execution of job-related tasks (Schmidt, Sasidharan, & Freeze, 2013). Wang and Wang (2012) conducted a research under the title of "knowledge sharing, innovation, and performance of companies" in which the researchers tried to confirm the indirect effect of knowledge sharing on performance through innovation, in contrast with the direct effect of which. The conceptual model of this study was experimentally developed by the collected data elicited from 89 high-tech companies in China. Findings revealed that explicit and tacit knowledge sharing facilitates innovation and performance. Moreover, it was found that explicit knowledge sharing has a more meaningful effect on the rate of innovation and innovation performance, while tacit knowledge sharing has a more meaningful effect on quality innovation and operational performance. Therefore, the present study develops the following hypothesis based on the literature review.

Hypothesis 4: *Knowledge management strategy has an indirect, positive, and meaningful effect on organizational performance with the mediating role of organizational innovation*

After the theoretical review, designing a conceptual model is necessary. Every conceptual model is used as a basis for conducting the study so that it illustrates all variables and their relations. You can see the conceptual model of the study in Fig. 1.

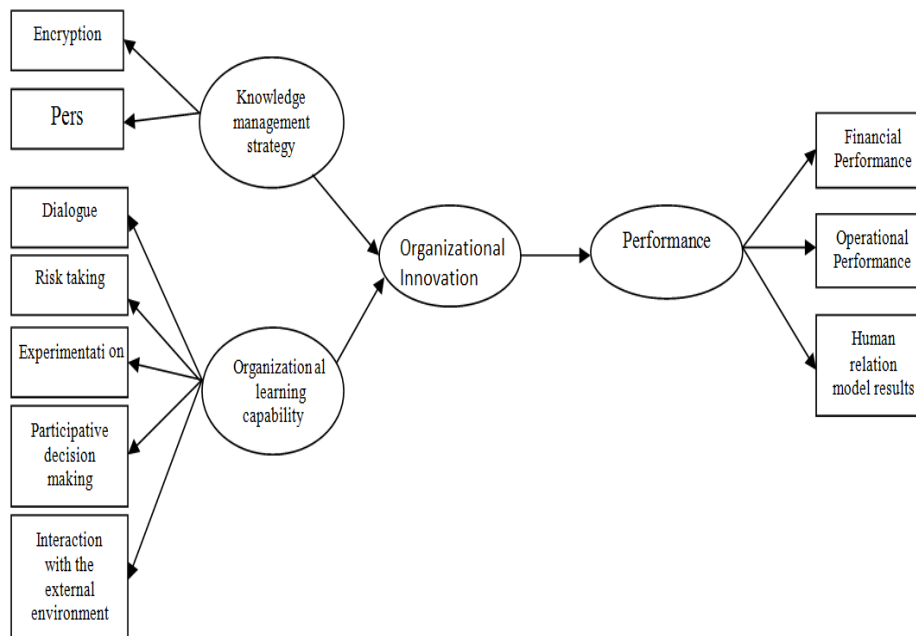


Fig. 1. Conceptual model of the study

4. Research methodology

The objective of this study is to investigate the causal relationships among organizational learning capacity, knowledge management strategy, organizational innovation, and performance. This is an applied research and has done as a Survey, cause-effect research. Therefore, based on the applied research objectives, we can conclude that the research is correlation-descriptive, and more specifically, based on structural equation modeling. In the analytical model of the research, knowledge management strategy and organizational learning capacity are considered as exogenous latent variables; and organizational innovation and performance as endogenous latent variables. On the other words, we can consider knowledge management strategy and organizational learning capacity as independent variables, Innovation as mediating variable, and performance as dependent variables.

The main ways of data gathering in this research are as follow:

- A) **Library studies:** collecting information from librarian resources such as articles, related researches, books, magazines, and databases to provide theoretical bases for the study.
- B) **Field studies:** A questionnaire (Appendix I) has been used to collect data and information. The questionnaire is consisted of 47 items. Of these items 3 items were about age, education, and experiences of the participants; 8 items were to assess knowledge management strategy; 14 items were to assess organizational learning capacity; 11 items were to assess innovation; and 11 items were to assess organizational performance. The aspects of this questionnaire are explained below.

Knowledge management strategy: assessing this variable, the researchers have used the questionnaire that is developed by Lee and Choi (2003). This questionnaire is made up of two aspects: encryption and personalization.

Organizational learning capacity: Chiva, Alegre, and Lapiedra (2007) have developed a questionnaire with five aspects to measure this variable. These five aspects are as follow: dialogue, experimentation, participative decision-making, risk taking, and interaction with external environment.

Innovation: in this study, innovation has been approached from two aspects: process and managerial innovation. The study's questionnaire has been adapted from the works of some scholars such as Jiménez-Jiménez and Sanz-Valle (2011), Lee and Choi (2003), Gunday, Ulusoy, Kilic, and Alpkan (2011), Prajoyo, Laosirihongthong, Sohal, and Boon-itt (2007), Medina and Rufín (2008), Teas (1994), and Lin (2001).

Performance: the three aspects of the questionnaire in this regard are financial, operational, and human relation model. The questionnaire has been adapted from the works of some scholars such as Jiménez-Jiménez and Sanz-Valle (2011), Quinn and Rohrbaugh (1983), Wang, Yeung, and Zhang (2011), Gunday, Ulusoy, Kilic, and Alpkan (2011), López-Nicolás and Meroño-Cerdán (2011), and Prajoyo, Laosirihongthong, Sohal, and Boon-itt (2007).

After developing the questionnaire, the reliability and validity of the questionnaire was evaluated. In order to measure the reliability, 30 questionnaires were piloted and then based on the results, the confidence coefficient was calculated using Cronbach's alpha model. It was 0.88 for knowledge management, 0.87 for organizational learning, and 0.91 for organizational innovation, and 0.85 for organizational performance. These results indicate that the questionnaires are reliable. Evaluating the validity, content and construct validity were considered. Content validity was assessed by experts of this field. Evaluating the construct validity, confirmatory factor analysis was used.

This study, with regard to the type of its variables, was in need of top organizational information. Therefore, top, intermediate, and operational managers are considered as the population of the study. However, it was not possible for researchers to have complete access to top managers of the company and consequently, most of the questionnaires were filled out by operational and intermediate managers. Due to the limited population, the census method was applied and questionnaires were sent to 278 managers, and of which, 161 questionnaires were correctly filled out and returned.

5. Findings

The demographic characteristics of the sample showed that, with regard to age, 67.8% of the population was 31-40 years old, and it indicates that the majority of them were youth, which may be rooted in the culture of the population. With regard to their experience, about 62.1% had an experience of 10–15 years. In addition, 63.2% had bachelors and master's Degree. If we consider knowledge of the participants as an effective factor in fitness model, the present research is in a good condition because the more aware and knowledgeable the participants are, the more reliable the results of the study would be. Although some aspects of the study's variables need exact and correct values, operational managers because of their knowledge and experiences have an overall view about this type of variables and reliably answer the questions in Likert scale.

Table 1
One-sample test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge management strategy	11.36	160	.000	4.0155	.200	.380
Organizational learning capability	-1.89	160	.060	2.4601	-.294	-.006
Organizational innovation	12.60	160	.000	3.9287	.361	.495
Performance	3.30	160	.001	3.6102	.044	.176

5.1. Normality test of research variables

For testing the normality of the data, Kolmogorov – Smirnov test was used. All variables were normal; therefore, we used parametric tests, and more specifically, the average test. Table 1 depicts the results of the average test applied on variables of the study. As can be seen in the table, the mean for knowledge management, organizational innovation, and organizational performance are 4.01, 3.92, and 3.61, respectively. The obtained values exceed the hypothesized mean (3) of the table. In addition, the significant level of these two variables calculated as 0.000 which is below $\alpha=0.05$ and the calculated t shows that the mean value of these variables are above average. Therefore, it can be concluded that the three variables are in good condition in this company. However, as you can see in Table 1, the significant level of organizational innovation exceeds 0.05. Moreover, the calculated t and upper and lower limits show that this variable is not in a good condition.

5.2. Evaluation of the measurement model of research variables

Before starting the hypothesis and research conceptual model testing process, it is necessary to ascertain the accuracy of measurement models for independent variable (knowledge management strategy and organizational learning), mediating variable (organizational innovation), and dependent variable (organizational performance). Therefore, measurement models for the four variables are explained below, using first and second order confirmatory factor analysis. Confirmatory factor analysis is one of the oldest statistical procedures for investigating the relationship between latent variables (factors) and observed variables (items), and determines the measurement model (Byrne, 1994).

5.3. Organizational learning and knowledge management strategy measuring model

The results of confirmatory factor analysis for organizational learning and knowledge management strategy indicated that all items have acceptable t-value (greater than 1.96) and load factor (greater than 0.3). In addition, among various dimensions of knowledge management strategy, encryption; and among dimensions of organizational learning, risk taking are of utmost importance. Fitness indexes of the model are Chi-square, GFI

(goodness-of-fit index), AGFI (adjusted goodness-of-fit index), NFI (Normed fit index), and RMR (Root mean-square residual). The model has a good fitness if the ratio of Chi-square to degree of freedom (df) is less than 3, NFI exceeds 90%, AGFI and GFI exceed 80% and RMSEA is less than 0,08 (Kalantari, 2009). Fit indices and load factors are presented in Tables 2 and 3 below.

Table 2

The results of the confirmatory factor analysis of the knowledge management strategy

Indexes	Variables	Factor loads
KM23	Encryption	0.88
KM24		0.86
KM25		0.56
KM26		0.52
KM27	Personalization	0.66
KM28		0.77
KM29		0.72
KM30		0.67
Fitness indexes	Exact values	Threshold values
Chi-square/df	2.03	<3
RMSEA	0.081	<0.08
GFI	0.93	>0.8
AGFI	0.88	>0.8
NFI	0.99	>0.9

Table 3

The results of the confirmatory factor analysis of the organizational learning

Indexes	Variables	Factor loads
OLC31	Experimentation	0.64
OLC32		0.32
OLC33	Risk taking	0.67
OLC34		0.54
OLC35	Interaction with the external environment	0.75
OLC36		0.68
OLC37		0.49
OLC38	Dialogue	0.79
OLC39		0.72
OLC40		0.70
OLC41		0.51
OLC42	Participative decision making	0.37
OLC43		0.52
OLC44		0.48
Fitness indexes	Exact values	Threshold values
Chi-square/df	2.32	<3
RMSEA	0.071	<0.08
GFI	0.91	>0.8
AGFI	0.89	>0.8
NFI	0.97	>0.9

Table 4

The results of the confirmatory factor analysis of innovation

Indexes	Variables	Factor loads
INO1	Process innovation	0.44
INO2		0.43
INO3		0.35
INO7	Managerial innovation	0.40
INO8		0.69
INO9		0.60
INO10		0.42
INO11		0.33
Fitness indexes	Exact values	Threshold values
Chi-square/df	1.43	<3
RMSEA	0.052	<0.08
GFI	0.92	>0.8
AGFI	0.87	>0.8
NFI	0.96	>0.9

5.4. Innovation and performance measuring model

First and second order confirmatory factor analysis indicated that items 4, 5, and 6 from organizational innovation variable and item 14 from performance variable have a load factor less than 0.3; therefore, these items have been removed from this model. After removing the items, confirmatory factor analysis revealed that load factors (above 0.3) and the t value (above 1.96) are appropriate. Fit indices of the model and load factors are shown in Tables 4 and 5.

Table 5

The results of the confirmatory factor analysis of performance

Indexes	Variables	Factor loads
OP12	Human relation model results	0.74
OP13		0.63
OP15		0.34
OP16	Operational performance	0.85
OP17		0.91
OP18		0.51
OP19	Finance performance	0.69
OP20		0.60
OP21		0.50
Fitness indexes	Exact values	Threshold values
Chi-square/df	2.40	<3
RMSEA	0.062	<0.08
GFI	0.84	>0.8
AGFI	0.81	>0.8
NFI	0.95	>0.9

5.5. Research hypotheses testing

By using measurements of the models and validity of which in addition to confirmatory factor analysis, we can determine the causal relationships among variables of the research. Causal relationships based on structural equation modelling are used to test the hypotheses of the research. Significant level is the criterion for rejection or confirmation of the hypotheses. If the significant level is larger than 1.96 or less than -1.96, the hypothesis will be confirmed. Otherwise, the hypothesis will be rejected. As can be seen below, the fitness indexes of the model are in good condition. The following results are obtained about the relationships among model components.

Knowledge management strategy has a positive, direct (0.80) and meaningful (9.22) effect on organizational innovation. Therefore, the first hypothesis is confirmed and we can conclude that applying knowledge management strategies in POGC would lead to increase in innovation. However, the effect of organizational learning on organizational innovation in standard mode equals 0.17 and in significant mode equals 1.30, which is below 1.96 and we can conclude that the second hypothesis, which indicates that organizational learning has a positive, direct, and meaningful effect on organizational innovation, is rejected. Organizational innovation has a positive, direct (0.75) and meaningful (8.98) effect on organizational performance (hypothesis 3 confirmation). Therefore, the fourth hypothesis, which says that organizational innovation has a mediating role for the relationship between knowledge management strategy and organizational performance, is confirmed; and it is concluded that knowledge management has an indirect, positive, and meaningful (0.60) effect on organizational performance.

As Fig. 1 reveals, RMSEA is 0.053 and the ratio of χ^2 to degree of freedom (df) is 1.79. Also, CFI, AGFI, GFI, and NFI are 0.96, 0.86, 0.93, and 0.94 respectively, which means that the model has an appropriate fitness. You can see the results of direct and indirect inter-variable relationships, significant coefficients model & fitness indexes of the model in Table 6, Fig. 2 & Table 7 respectively.

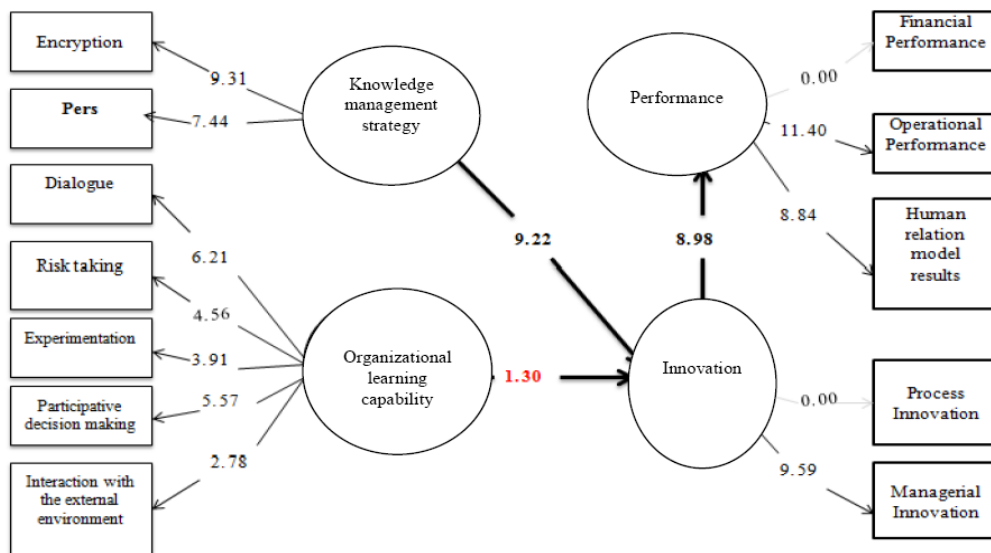


Fig. 2. Significant coefficients model

Table 6

The results of direct and indirect inter-variable relationships

Hypothesis	Direct influence	Indirect influence
Knowledge management has a positive, direct, and meaningful effect on organizational innovation.	0/80	
Organizational learning has a direct, positive, and significant effect on organizational innovation.	0/75	
Organizational innovation has a positive, direct, and meaningful effect on organizational performance.	0/17	
Knowledge management strategy through the moderating role of organizational innovation has an indirect, positive, and meaningful effect on organizational performance.		0/60

Table 7

Fitness indexes of the model

	Chi square/df	RMSEA	CFI	GFI	AGFI	NFI
Exact values	1.79	0.053	0.96	0.93	0.86	0.94
Threshold values	<3	<0.08	>0.9	>0.8	>0.8	>0.9

6. Discussion and conclusion

Organizational knowledge is whatever the organization's employees know about culture, processes, products, services, customers, markets, and organization's rivals. Organizations can increase their competitive power through effective management. Acquisition, creation, and transmission of new knowledge in an organization leads to innovation in processes and products, improves the quality of products, increases customer satisfaction, and ultimately improves the organization's competitive position. This study investigated the effect of knowledge management strategy and organizational learning capability on performance with the emphasis of organizational innovation. The results revealed that knowledge management strategy has a positive and meaningful effect on innovation in organizations. Therefore, based on which we can conclude that knowledge management can have an effective effect on the rate of organizational innovation. The obtained results about the effect of knowledge management on innovation in this study are in line with the results obtained by Birasnav (2013). They found that knowledge management processes such as knowledge acquisition, transmission, and application has a positive relationship with process innovation. Vaccaro, Parente, and Veloso (2010) and Liao (2011) are of other scholars that have found similar findings and all insisted on the effect of knowledge management on organizational innovation. They all came to this conclusion that the existence of knowledge management in any organization leads to creativity and innovation in that organization. Moreover, it was inferred that knowledge management strategy has an indirect effect on organizational performance with the mediating role of innovation. Thus, if organizations are willing to solve their problems and become innovative, they should apply knowledge management efficiently in their organizations. As the second finding, it was concluded that organizational innovation has a positive and meaningful effect on organizational

performance and this finding focuses on the important role of innovation on financial and non-financial performance of the organization. Hence, the effect of innovation on performance is concluded to be direct and positive. Many other researchers have investigated this hypothesis and in most of the cases it has been confirmed (Rosenbusch, Brinckmann, & Bausch, 2011; Gunday, Ulusoy, Kilic, & Alpkan, 2011; García-Morales, Loréns-Montes, & Verdú-Jover, 2008). In this study, innovation, which was a combination of managerial and process innovation, had a positive and meaningful effect on financial and non-financial aspects of the performance. In spite of the fact that previous researchers have claimed the positive and meaningful relationship between learning and innovation in organizations (Bolívar-Ramos, García-Morales, & García-Sánchez, 2012; Ho, 2011); However, our findings did not confirm the effect of organizational learning on innovation and shed light on the fact that learning in POGC has no effect on innovation and cannot lead to increase in innovation. Scholars in this field have stated that in organizational learning theory, the notion of organizational learning is the process of acquiring and enhancing the new knowledge and capabilities; and that this process can lead to enhancement in organizational activities. In general, based on the obtained results we can claim that noticing to the knowledge management is a dynamic process and requires a proper arrangement of factors such as human resources, processes, and cultural infrastructures of the organization. Knowledge management is a participative and group activity that all employees in all levels of the organization should be involved.

Based on the results, knowledge management strategy was considered as one of the preconditions and effective factors on innovation and organizational performance. In addition, if we are going to approach the knowledge management, effectively, we should develop appropriate strategies with regard to the intended organization and knowledge we have. So it was found that the implementation of knowledge management strategy in order to manage the knowledge effectively leads to innovation characteristics such as creativity, idea creation and facilitation of innovative behaviors. In the following part, according to gathered data and statistical procedures carried out, some suggestions are proposed:

1. Professional documentation in different petroleum projects, using knowledge management software;
2. Creating the knowledge sharing culture in organization through incentive behaviors of the organization and establishing knowledge networks inside the organization;
3. Implementation of new managerial methods in different levels of the organization for the sake of increase in the rate of innovation;
4. Motivating organizational staffs, both materially and non-materially, in order to involve the employees in organizational processes and prevent them from stopping the process of learning and development;
5. Integration of employees' knowledge and prevention of the formation of individual database; and
6. Prioritizing the implication of explicit knowledge over tacit knowledge, because of fledgling issue of knowledge management in organizations.

7. Limitations

This study has encountered some limitations and generalization of the results to other organizations should cautiously be done. The first limitation was about not having complete access to top managers of the company as well as some intermediate and operational ones that lengthened the process of conducting the research. The second limitation was about the small sample sizes because of the first limitation. And the third limitation was about the case study. Only one company has considered in this research.

8. Suggestions for future studies

There are several suggestions that can be used in future researches. The first one is about the direct effects of knowledge management strategy & organizational learning capability on performance. This aspect was not considered in the conceptual model for this study. The second one is about the domain of study. Only one company has used in this research. So all related companies in oil and gas industry should be considered for future researches. And the third suggestion for future study is about the variable's dimensions. The other aspects of variables such as KM source for knowledge management strategy can be used in future researches and the results can be compared to the ones that are included in the present study.

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Appendix I.

A.1. Study measures

Knowledge management strategy:

1. Encryption (codification)

- Knowledge (idea, know-how, technical skill, problem solving methods, or etc.) is well codified in my company.
- Knowledge can be acquired easily through formal documents and manuals in my company.
- Results of projects and meetings should be documented in my company.
- Knowledge is shared in codified forms like manuals or documents in my company.

2. Personalization

- Knowledge is easily acquired from experts and co-workers in my company.
- It is easy to get face-to-face advice from experts in my company.
- Informal dialogues and meetings are important methods for knowledge sharing in my company.
- One-to-one mentoring is frequently used for knowledge acquisition in my company.

Organizational learning capability:

1. Experimentation

- People here receive support and encouragement when presenting new ideas.
- Initiative often receives a favorable response here so people feel encouraged to generate new ideas.

2. Risk taking

- People are encouraged to take risks in this organization.
- People here often venture into unknown territory.

3. Interaction with the external environment

- It is part of the work of all staff to collect, bring back, and report information about what is going on outside the company.
- There are systems and procedures for receiving, collating and sharing information from outside the company.
- People are encouraged to interact with the environment: competitors, customers, technological institutes, universities, suppliers etc.

4. Dialogue

- Employees are encouraged to communicate.
- There is a free and open communication within my work group.
- Managers facilitate communication.
- Cross-functional teamwork is a common practice here.

5. Participative decision making

- Managers in this organization frequently involve employees in important decisions.
- Policies are significantly influenced by the view of employees.
- People feel involved in main company decisions.

Organizational innovation

1. process innovation

- The company has been attempting to increase the number of efficient changes in working processes during the past 3 years.
- The number of improved processes has been increasing during the past 3 years.
- The company has been performing great works in identifying and eliminating such activities which are not valuable during the past 3 years.
- The company has been achieving to considerable advances in reducing the cost of working processes during the past 3 years.
- Technological backwardness between our company and the other ones in industry has been decreasing during the past 3 years.

2. managerial innovation

- The company's managers have been performing great activities in the implementation of administrative systems during the past 3 years.
- The company has been doing important practices about renewing the quality management and production systems during the past 3 years.
- Cooperation between units of the company has been improving by restructuring the organization during the past 3 years.
- The company has been benefited from innovation about managerial processes during the past 3 years.
- Innovative programs have been accepted quickly in project management during the past 3 years.
- The utilization of novel administrative systems in order to evaluate the performance has been giving better view about personnel's activities.

Performance

1. Human relations model results

- The rate of personnel's absenteeism has been decreasing meaningfully during the past 3 years.
- The rate of personnel's turnover has been decreasing meaningfully during the past 3 years.
- The company has been performing great in selection during the past 3 years.
- The company's practices has been achieved to great creative and innovative behaviors in staff during the past 3 years.

2. Operational performance

- The quality of products/ implementing projects has been improving meaningfully during the past 3 years.
- The cost of production/ project's implementation has been improving meaningfully during the past 3 years.
- The speed of doing activities in projects has been increasing meaningfully during the past 3 years.

3. Financial performance

- The mean of growth in benefits has been calculated positively during the past 3 years.
- The mean of growth in sales has been calculated positively during the past 3 years.
- The mean of growth in cash flow has been calculated positively during the past 3 years.
- The mean of growth in ROI has been calculated positively during the past 3 years.