Identification and Prioritization of the Criteria Measuring Organizational Capital in the Oil Industry using Grey Systems Theory

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ABSTRACT

The organizational capital is one of the important components of the intellectual capital. The organizational capital can be regarded as one of the infrastructures for organizational learning which represents the capability of the organization to acquire new competencies and knowledge. Regarding the changes in the intangible assets of organizations in gaining and sharing knowledge in the today's knowledge-based world, the organizations that have vigorous organizational capital can provide a safe and supporting environment for the staff in order to exert their capabilities to create and share the knowledge. Therefore, the organizational capital is an infrastructure in term of organizational successes so that it plays a vital role in achieving the goals of organization. Managing and directing "Organizational Capital" entails identification and measurement of its attributes. Although the literature on the intellectual capital is rich, the review shows that few researches have studied the organizational capital models and the related attributes. Hence, at first, this study aims to collect the organizational capital attributes through reviewing the literature and classify them as a comprehensive model. Then, a Multiple Attribute Decision Making (MADM) approach in uncertainty situation has been utilized in order to prioritize and rank the classified attributes by gathering the opinions of experts. In this study, the Grey systems theory has been used for the first time as a method to deal with uncertainty inherent in the in the organizational capital measurement. Whereas the presented comprehensive model can be applied in different situations and industries, it seems that this model may have different attribute weights with regard to the nature of organizations' activity and internal and external conditions of the specified industry. Finally, the proposed methodology has been utilized in the petroleum industry in Iran and prioritization procedure and ranking results have been illustrated step by step.

1 Introduction

The survival and the growth of organizations as well as achieving competitive benefits entails the organization potency to create, save, distribute and use the intellectual assets and capital within the organization. The concept of intellectual capital includes the knowledge of organization members and the use of their knowledge. The intellectual capital is a term to combine the intangible assets, intellectual capital, human capital and infrastructures that makes the organization more capable (Brooking, 1996). The

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measurement of intellectual capital and the related models date back to 1990's when many studies were done on measuring and evaluating the technical literature. (Atafar and Alinaghian, 2008). The study of technical literature shows that most of the models have considered three aspects of human, rational and organizational capital for intellectual capital (Habibi et al., 2010).

If an organization has the human capital with high capabilities but its structure, rules, occupational systems and the organizational processes are weak, the organization won't be able to utilize the staff efficiently in creating the organizational values. On the other hand, the organizations having the vigorous organizational capital can provide safe and supporting environment for the staff in order to use their abilities to create and share effective knowledge. Furthermore, the organizational capital is considered as essential infrastructure for organization success and it plays a vital role in achieving the organizational goals and in measuring the intellectual capital. It is unavoidable that the organizational capital should be measured in order to manage and direct this effective and important component. Although, the reviews show that there are few studies in the literature investigating the development of models for organizational capital and the related attributes. Hence, the present study attempts to identify and collect the "organizational capital" attributes by reviewing the literature which is classified in the form of a comprehensive model. The results are presented in Section 8.

Since the 1980s, financial analysts have noticed changes in the ratio of the value of firms' equity in the market to their net assets value (reflected in their balance sheets). In other words, over 80% of firms' value for traded stock in the capital market was allocated to their intangible assets (Lev, 2001). Thus, the role and importance of capitals and sources creating value for the organizations have encountered major changes. In the economy known as knowledge-based economy, intangible assets are more important than tangible and physical capital in creating value for organizations. Regarding these global changes, organizations have to take various measures and actions for the conscious and systematic identification and management of their intangible assets, in particular their intellectual and organizational capital, in order to achieve a sustainable competitive advantage. Understanding such an evolution, the petroleum industry has considered the management of intellectual capital as a framework for promoting its activities and carrying out corrective actions and organizational and managerial changes. With this approach, it is necessary

to develop a model for measuring organizational capital in the oil industry, which has been addressed in this study.

Nowadays, most of the managers have agreed with the role of intangible capital including the organizational capital. However, due to the limited resources, it is necessary to identify the different aspects of organizational capital and prioritize them based on their situation and importance to direct and prioritize the actions done by organization in order to improve the status of organizational capital.

The attributes mentioned in the literature in order to measure the organizational capital generally emphasize on the intangible assets. These assets can be considered as the organizational capital just when the employees use them to generate the knowledge and the organizational value. Hence, with respect to the complications on determining and interpreting attributes measuring the organizational capital and their dependence on the experts' ideas in the organization, it seems very hard to extract the relative importance of the attributes and the measurements by quantitative data explicitly (Bozbura, 2004). On the other hand, prioritizing and ranking the attributes that influence measuring the intellectual and organizational capital can be studied by nature of multi-attribute decision analysis. Hence, in the literature, Multiple Attribute Decision Making (MADM) method has been used to prioritize the organizational capital attributes considering uncertainty situations. Beskee & Bozbura (2007) have recommended use of Fuzzy AHP for this purpose. Althogh the Fuzzy theory is one of the well-known models to deal with the qualitative attributes in the uncertainty situation, it requires extracting the Fuzzy membership functions. Use of the Grey numbers makes possible the evaluation of qualitative criteria in the uncertainty situation. The Grey systems theory was introduced by Deng in the beginning of 80's to be used in the uncertainty situations by limited data and inadequate/incomplete information (Deng, 1989). The theory of Grey systems was provided as the extension of Fuzzy theory that includes it as well (Liu & Lin, 2006). Use of Grey systems theory in prioritizing the organizational capital attributes has the benefit that it can operate in uncertainty situation without extracting the Fuzzy membership functions and only based on the existing range of information (Dabbaghi et al., 2010). Furthermore, use of Analytical Hierarchy Process (AHP) requires gathering experts' opinions through pairwise comparisons. In this process increasing the number of attributes leads to potentially increase in the number of needed pairwise comparisons which is more time consuming and occurrence of inconsistency among collected

data is more possible. The methodology proposed in this study (Section 4-3) enables to identify and rank the organizational capital attributes dealing with uncertainty situation without execution of pairwise comparisons among attributes.

The remaining of this paper is as follows: After introduction, section 2 reviews the technical literature including; the organizational capital and the theory of Grey systems. The goal of the study is explained in section 3. The steps of fulfilling the research and the conceptual model are described in section 4. Besides, the methodology for ranking the organizational capital attributes is presented and illustrated step by step. The scope of research has been explained in section 5. The way of collecting data in the scope of the research (Oil, gas and Petrochemical industry)

is defined in section 6. Findings of the research are presented in section 7. Finally, this paper ends by discussing and concluding in section 8.

2 Technical Literature review
2.1 Organizational Capital

In general, the concept of intellectual capital has been categorized in three aspects: 1- relational capital, 2- organizational capital, 3- human capital (Bozbura & Beskese, 2007). The organizational capital is the main subject of the present essay called the structure capital, in some cases. The organizational capital is everything that exists in the organization and supports human capital to do organiza-

Table 1- Identification and classification of attributes measuring the organizational capital

Organizational Capital Attributes	The organizational culture	The philosophy of management	The organizational processes	The information systems	The occupational systems	The organizational structure	The strategy and mission of organization	The organizational learning and knowledge	The organizational entrepreneurship
Paula &Michela (2010)	*	*	*						
Canadian imperial bank (Noori et al., 2010)	*				*	*	*		
Intellectous model (CIC, 2003)	*					*		*	
Ranai et al., (2010)	*		*	*		*			*
Badpar (2011)			*	*		*			
Atafar and Alighian (2008)	*		*			*		*	
Martin-de-Castro et al (2006)	*					*		*	
Bozbura&Beskese (2007)	*		*	*	*		*	*	
Konrad Group (Cohen &Kaimenakis, 2007)			*					*	
Roos(1997)			*					*	
Bontis (1998)	*		*					*	
Mayo (Cohen &Kaimenakis, 2007)	*		*					*	
Scandia (Cohen &Kaimenakis, 2007)	*		*					*	
Afjeh and Ghaderpoor (2010)	*		*					*	

tional activities. In the better words, the organizational capital includes all of the non-human knowledge resources in the organizations (Shahaei and KhaefAlahi, 2010) left in the organization when the staff leave workplace toward their homes (Roos, 1997). The organizational capital as one of the aspects of the intellectual capital is the collection of intangible assets of the organization that has the capability for providing value in the organization.

There are different studies on intellectual capital that explain the attributes and dimensions of organizational capital. This study attempts to identify and collect the attributes measuring only "organizational capital" by reviewing the literature. The results have been shown in table 1.

There are various studies in the management literature containing the definitions of the attributes mentioned in Table 1 and the methods for their measurement. Here, the concept of these attributes has been described, briefly. The "organizational culture" is a collection of common values, norms and beliefs among the individuals and the groups of organization which guides their behaviors (Dabbaghi et al., 2010). The "philosophy of management" is defined as the process of thinking on existence of the organization or use of the mental potency and the value system to find the true views, to determine the priorities, to create the logical relations between different beliefs and theories and finally, to judge about the organizational and managerial affairs (Mir-Kamali, 2013). In this model, the philosophy of management is a mental approach toward the activities and the management goals by the manager or the collection of organizational management influencing the management style, distribution of information in the organization as well as the methods of interactions and communications. The "organizational processes" are the collection of steps, activities and the intentional duties that alters one or many inputs to one or many outputs so that, they lead to improve the performance or the value of goods and services provided by the organization using necessary infrastructures as well as the specific mechanisms and methods. The "information system" is the application of information and communication technology (ICT), both software and hardware, to support activities of the organization at different levels in order to improve the accessibility of information, automation, facilitating organizational decisions and so on. The "occupational systems" are referred to the methods by which the organization can monitor and implement its processes. The "organization structure" is the method to distribute duties, responsibilities, and authorizations and define the position of every member in the organization to

reach the mission. The "strategy and mission of organization" is the collection of directions, goals and the grand strategies of the organization as well as the methods and practical plans to achieve the goals by planning, designing, examining, implementing, monitoring and evaluating. The "organizational knowledge and l   earning" means use of wisdom of the crowd through the tools managing the knowledge in order to achieve the organizational learning. The "organization entrepreneurship" is referred to ability to reconstruct and obtain innovative results or to produce a new product focused on innovation and risk using the commercial rights, the intellectual assets and the management methods.

2.2 Grey Systems Theory
2.2.1 Introduction of Grey Systems Theory

In most of the systems such as the social, economic and industrial ones, the denomination is usually based on the subjects studied in these systems. Regarding it, the Grey systems have been denominated according to the color of related topics. In the control theory, for example, the degree of darkness indicates the resolution of information and data. One of the best examples is the black box. This word is referred to a segment whose internal structures and relations are absolutely encoded so they are unknown. Here, the word, "black" implies the unknown information. The word, "white" is used for the known information and "Grey" is utilized to that information some parts of which are known while the other parts are unknown. Therefore, the system having completely known information is called "white system" and the systems having unknown information or lack of data is called "black system". Finally, the systems having both known and unknown information is called "Grey systems" (Li & Liu, 2008).

2.2.2 Grey Numbers and Their Operations

Definition 1: The Grey Number:

A grey system is defined as a system containing uncertain information presented by a grey number and grey variables.

let X be the universal set; then a grey set G of X is defined by its two mapping   and .

by $\overline{\mu}_G(x)$ and $\underline{\mu}_G(x)$.

$$\begin{cases} \overline{\mu}_G(x): x \to [0,1] \\ \underline{\mu}_G(x): x \to [0,1] \end{cases} \tag{1}$$
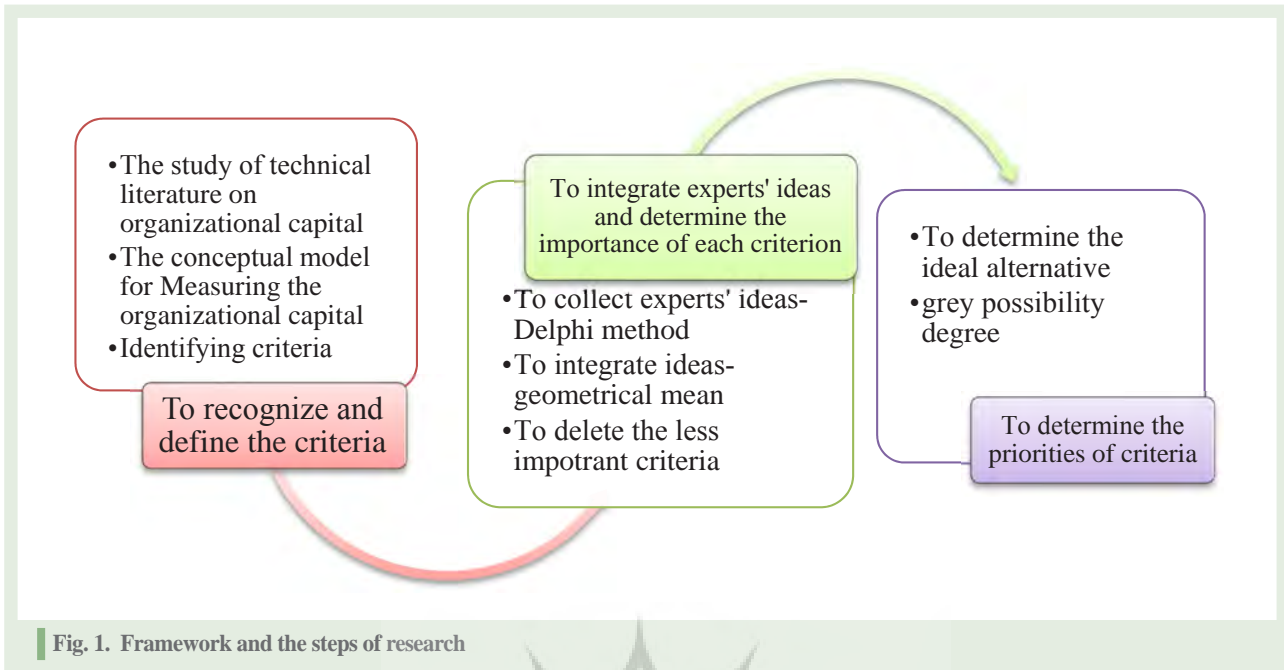
Where are the upper and lower bound of G membership

Fig. 1. Framework and the steps of research

function, respectively. When = , the G grey set is converted into the Fuzzy set. This ability indicates the inclusion of Grey theory respect to the Fuzzy states and its flexibility in front of uncertain problems.

Definition 2: Grey Number Operations

The basic operations of Grey numbers $\otimes G_1 \in \lfloor \underline{a}_1, \bar{a}_1 \rfloor$ and $\otimes G_2 \in \lfloor \underline{a}_2, \bar{a}_2 \rfloor$ can be defined as follows (Malek et al., 2011).

$$\otimes G_1 + \otimes G_2 \in \lfloor \underline{a}_1 + \underline{a}_2, \bar{a}_1 + \bar{a}_2 \rfloor \quad (2)$$

$$\otimes G_1 - \otimes G_2 \in \lfloor \underline{a}_1 - \bar{a}_2, \bar{a}_1 - \underline{a}_2 \rfloor \quad (3)$$

$$\otimes G_1 \times \otimes G_2 \in \left[\min\left(\underline{a}_1 \underline{a}_2, \underline{a}_1 \bar{a}_2, \bar{a}_1 \underline{a}_2, \bar{a}_1 \bar{a}_2 \right), \max\left(\underline{a}_1 \underline{a}_2, \underline{a}_1 \bar{a}_2, \bar{a}_1 \underline{a}_2, \bar{a}_1 \bar{a}_2 \right) \right] \quad (4)$$

$$\otimes G_1 \div \otimes G_2 \in \lfloor \underline{a}_1, \bar{a}_1 \rfloor \times \left[\frac{1}{\bar{a}_2}, \frac{1}{\underline{a}_2} \right] \quad (5)$$

Definition 3: If k is a real positive number, the scalar multiple of k in G set will be as follows:

$$k \cdot \otimes G \in \lfloor k\underline{a}_1, k\bar{a}_2 \rfloor \quad (6)$$

Definition 4: The length of grey number represented by $\ell(\otimes G)$ is defined as follows:

$$\ell(\otimes G) = \lfloor \bar{a} - \underline{a} \rfloor \quad (7)$$

3 Aim of Study

Regarding the importance of the subject and the re-search gap mentioned in section 1, the aim of the present study is to identify and collect the attributes measuring "organizational capital" by reviewing the literature which is classified in the form of a comprehensive model and presented in the section 4-2.

Besides, with respect to the diversity of criteria and their qualitative nature, a methodology is introduced (section 4-3) in order to rank organizational capital attributes using Multiple Attribute Decision Making (MADM) approach in uncertainty situation and implemented in the oil, gas and petrochemical industry (section 6).

Fig. 2. Conceptual model for measuring the organizational capital

Table 2- Five-degree scale for measurement the importance of criteria (Dabaghi, et al., 2010)					
Scale	Very high	High	Middle	Low	Very low
	VH	H	M	L	VL
$\otimes G$	[9,10]	[6,9]	[4,6]	[4,6]	[0,1,1]

4 Research Methodology
4.1 Research Framework and Steps

Framework and the steps of doing this research have been shown in Fig 1.

4.2 Conceptual Model for Measuring the Organizational Capital

After reviewing the models of intellectual and the organizational capital in the technical literature as well as combining and classifying the conventional models and viewpoints on organizational capital, a comprehensive model of criteria measuring organizational capital is considered as the conceptual model in the research (Fig 2).

4.3 Use of grey systems theory in measuring the organizational capital

With regard to qualitative nature of the problem which is ranking the organizational capital attributes, the necessity of dealing with this problem in the uncertainty situation mentioned in section 1. Hence, with respect to the number of attributes and their qualitative nature, a methodology is introduced and utilized in order to rank organizational capital attributes using Multiple Attribute Decision Making (MADM) approach in uncertainty situation. The proposed methodology is explained in this section step by step.

First step: Attributes Identification

Suppose $Q = \{Q_1, Q_2, \ldots, Q_n\}$ is a collection of n criteria for measuring the organizational capital (the independent collection of criteria) that are derived according to the conceptual model of measuring the organizational capital by reviewing and studying the technical literature. The results have been shown in Table 1 (n=9).

Second step: Collecting the experts' opinion about the importance of attributes

In this research, the grey systems theory (section 2.2) has been utilized in order to encounter the uncertainty situation and the qualitative nature of attributes. The five-degree linguistic scale based on Grey numbers is proposed to extract the relative importance of attributes (Table 2).

Third Step: Aggregating the experts' opinions

After collecting the experts' opinions (suppose that the number of experts is k) about the importance of each attribute regarding the linguistic scale proposed in the second step, it is necessary to aggregate the experts' opinions about the importance of each attribute. In this research the aggregation was performed based on equation 8 (Dabbaghi, et al., 2009).

$$\otimes G_j = \sqrt[k]{\left[\otimes G_{j1} \times \otimes G_{j2} \times \cdots \times \otimes G_{jk} \right]} \tag{8}$$

Where $\otimes G_{jk}$ is the importance of jth criteria by the kth decision maker (expert).

Fourth Step: Deleting the less important attributes

After calculating the importance of each attribute, in order to accelerate the evaluation and decrease the number of attributes, the less important attributes can be deleted using definition 5 (Dabbaghiet el, 2009).

Definition 5: $\overline{G}_i < \underline{G}^H$ then jth attribute can be deleted from the set of attributes. $\underline{G}^H$ is the lower limit of high (H) scale that is equal to 6 based on Table 2.

Fifth Step: Determining the ideal Alternative

Regarding the uncertainty approach and the use of grey numbers to determine the importance of attributes, the importance of each attribute is obtained at the end of the third step in the form of grey numbers. In order to compare and rank the attributes, it is necessary to use one of the mathematical methods introduced in the Grey systems theory literature for ranking grey numbers (Malek et al., 2011). Therefore, the positive ideal alternative or the best possible (assumed) solution can be calculated using the equation 3 as the basis to compare other alternatives.

$$\otimes G^{\max} = \left\{ \left[\max_{1 \leq j \leq n} \underline{G}_j, \max_{1 \leq j \leq n} \overline{G}_j \right] \right\} \tag{9}$$

Sixth Step: Determining the priorities of criteria

For two Grey numbers $\otimes G_j = \lfloor \underline{G}_j, \overline{G}_j \rfloor$ $\quad \otimes G^{\max} = \lfloor \underline{G}^{\max}, \overline{G}^{\max} \rfloor$ grey possibility degree" can be calculated as follows (Taghari-Fard and Malek, 2011).

$$P\{\otimes G_j \leq \otimes G^{\max}\} = \frac{\max\{\cdot, L - \max(\cdot, \overline{G}_j - \underline{G}^{\max})\}}{L} \tag{10}$$

Where $L = \ell(\otimes G_j) + \ell(\otimes G^{\max})$

The value of l is equal to the length of G Grey number computed by definition 4.

The less the value calculated for $P\{\otimes G_j \le \otimes G^{\max}\}$ the ranking of the jth attribute is the better and vice versa.

5 Research Scope

Nine recognized attributes and the developed conceptual model (section 4-2) were extracted through reviewing the literature independent from the scope of implementation. So, basically it can be utilized in all organizations and industries. However, situation of the criteria and their relative importance weights will be different due to the nature of organization activities as well as the internal - external conditions of the specified industry. Hence, in this study prioritizing the organizational capital attributes based on the developed methodology has been utilized in the scope of Iranian petroleum industry including the "Ministry of Petroleum (MoP)", "National Iranian Oil Company (NIOC)", "National Iranian Gas Company (NIGC)", "National Iranian Oil Refining and Distribution Company (NIORDC)" and "National Iranian Petrochemical Company (NIPC)" and the results have been presented in section 8.

6 Data Collection and Implementation
6.1 Data Collection

Regarding the explanations provided in section 5, the scope of research is considered in the Iran petroleum industry. Hence, in order to implement the methodology described in section 4, at first, a list of experts who are working in the headquarters of the Ministry of Petroleum, National Iranian Gas Company (NIGC), National Iranian

Gas Company (NIGC), National Iranian Oil Refining and Distribution Company (NIORDC) and National Iranian Petrochemical Company (NIPC) having at least master degree in the relative majors and being familiar with the issues of human resource management in the petroleum industry (at least seven years of experience in the human resources departments) or having management experiences were identified and selected. With regard to some limitations in conducting the research such as experts' accessibility, research time duration and the collected data sufficiency, 22 persons from the above mentioned list were chosen as the research experts. Since data collection from two experts was impossible, the opinions of 20 experts were collected finally and considered as the basis for calculations (k=20). A questionnaire has been used to collect the experts' opinions about the importance of each attribute using the grey numbers based on the linguistic scale proposed in the second step of section 4-3.

6.2 Reliability and Validity

In order to assess the validity, the provided questionnaire was given to three professors in management field and the experts of organization. So, the content validity of the questionnaire was confirmed in order to measure research attributes.in order to ensure Reliability, the Cronbach's alpha was calculated which was equaled to 0.82. Also, the Delphi method has been used to achieve consensus among experts' opinions. In this sense, the experts' opinions were put in the iteration, and then the deviation of the opinions is decreased through repeating the iteration on inconsistent ideas. The inconsistent opinions mean some experts consider some attributes as very important attributes while

Table 3: The collected ideas of experts on the criteria fir measuring organizational capital

	D$_1$	D$_2$	D$_3$	D$_4$	D$_5$	D$_6$	D$_7$	D$_8$	D$_9$	D$_{10}$	D$_{11}$	D$_{12}$	D$_{13}$	D$_{14}$	D$_{15}$	D$_{16}$	D$_{17}$	D$_{18}$	D$_{19}$	D$_{20}$
Q$_1$	VH	H	VH	VH	H	VH	VH	VH	H	VH	H	VH	H	H	VH	H	VH	H	H	VH
Q$_2$	H	H	H	M	H	L	H	VH	H	M	H	H	VH	VH	H	H	H	H	H	VH
Q$_3$	H	M	H	VH	VH	H	H	H	VH	H	M	H	M	M	H	H	H	M	VH	H
Q$_4$	H	H	VH	VH	H	VH	VH	VH	VH	M	M	M	M	H	H	H	M	H	H	H
Q$_5$	H	M	VH	H	VH	H	VH	VH	VH	H	H	M	L	H	M	H	M	M	M	M
Q$_6$	H	H	VH	VH	VH	H	H	H	VH	H	M	M	H	H	M	M	L	L	M	M
Q$_7$	M	M	M	M	H	VH	H	VH	VH	M	M	L	L	L	M	M	H	M	M	M
Q$_8$	M	L	VL	H	M	H	H	H	H	H	L	L	L	M	L	M	L	M	L	L
Q$_9$	M	L	VL	M	L	M	H	H	H	M	M	M	L	VL	L	L	M	L	M	VL

other experts may find them as less important ones.

7 Research Findings

In this section, the proposed methodology (presented in section 3-4) is utilized in the petroleum industry and the findings are illustrated step by step.

First Step: the set of nine attributes which is identified based on the literature review (section 2-1) and the developed conceptual model (section 4-2) is as follows:

Q_1: The organizational culture
Q_2: The philosophy of management
Q^3: The organizational processes
Q_4: The information systems
Q_5: The occupational systems
Q^6: The organizational structure
Q_7: The organizational strategy and mission
Q_8: Organizational knowledge and learning
Q_9: Organizational entrepreneurship

Second Step: The experts' opinion about importance of each attribute was collected using questionnaire (section 6-1). Evaluating the collected opinions in the first iteration shows inconsistency in the seventh and ninth attributes according to the Delphi method described in section 6-2. Therefore, in the second iteration, the experts were encouraged to revise their earlier opinions in light of the other experts' opinions and viewpoints about the above mentioned attributes. So, the consistent data have been gathered and presented in Table 3

Third Step: The importance of each attribute was calculated based on equation 8. The results are as follows:

Forth Step: Regarding definition 5, the 8th and 9th at-

$$\otimes G_j = [\ \underline{G_j}\ ,\ \overline{G_j}\ ]$$
$$\otimes G_1 = [\ 7.50\ ,\ 9.54\ ]$$
$$\otimes G_2 = [\ 5.71\ ,\ 8.48\ ]$$
$$\otimes G_3 = [\ 5.88\ ,\ 8.31\ ]$$
$$\otimes G_4 = [\ 6.12\ ,\ 8.39\ ]$$
$$\otimes G_5 = [\ 5.27\ ,\ 7.70\ ]$$
$$\otimes G_6 = [\ 4.82\ ,\ 7.50\ ]$$
$$\otimes G_7 = [\ 3.90\ ,\ 6.48\ ]$$
$$\otimes G_8 = [\ 2.25\ ,\ 5.32\ ]$$
$$\otimes G_9 = [\ 1.68\ ,\ 4.36\ ]$$

tributes were considered as the less important attributes and removed from the remainder procedure.

Fifth Step: based on equation 9, the assumed ideal alternative is as follows:

$$\otimes G^{max} = [\ 7.50\ ,\ 9.54\ ]$$

Sixth Step: The grey possibility degree is calculated for each attribute as follows:

$$P(G_1 < G_{max}) = 0.50$$
$$P(G_2 < G_{max}) = 0.76$$
$$P(G_3 < G_{max}) = 0.80$$
$$P(G_4 < G_{max}) = 0.78$$
$$P(G_5 < G_{max}) = 0.95$$
$$P(G_6 < G_{max}) = 1.00$$
$$P(G_7 < G_{max}) = 1.00$$

8 Discussions and Conclusion

In this study, a set of 9 attributes was identified through reviewing the literature. A conceptual model was developed and the relative importance of each attribute was extracted by experts' opinions. Regarding to the number of attributes and their qualitative nature, this research proposed a methodology based on the Multiple Attribute Decision Making (MADM) approach in uncertainty situation in order to determine importance of each attribute and rank them. The proposed methodology explained by general steps in order to be applicable in different industries and organizations. In this research the methodology is utilized in the scope of petroleum industry in Iran and the experts opinions in this industry were collected and aggregated using Grey systems theory.

Table 4- Prioritizing the criteria of organizational capital in the oil, gas and petrochemical industries	
Ranking	The title of criteria
1	Q_1= The organizational culture
2	Q_2= The philosophy of management
3	Q_3= The information systems
4	Q_4= The organizational processes
5	Q_5= the occupational systems
6	Q_6= The organizational structure Q_7= The organizational strategy and mission of

With respect to the performed calculations the "organizational knowledge and learning" and the "organizational entrepreneurship" were considered as attributes with little importance. So, they were removed from the remainder procedure. In order to rank the remaining 7 attributes, the "Grey possibility degree" was calculated and the related results are shown in Table 4.

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