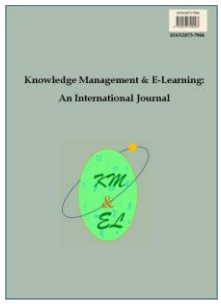
Knowledge Management & E-Learning



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The role of intellectual capital in promoting knowledge management initiatives

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Abstract: This paper investigates the role of intellectual capital in promotion of successful knowledge management (KM) initiatives. The conclusions are based on the results of field studies conducted in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province). Before designing the conceptual framework, relevant literature pertaining to the history of the work at hand, was reviewed by the researcher. Based on the opinions of external experts, university professors and organization's experienced executives, a research model was developed. Tools such as textual analysis and interviews were employed to explore relationships between intellectual capital and knowledge management. A survey was conducted using a structured questionnaire which measured research variables like intellectual capital indexes and KM processes. The output of structural equations models (SEM) and LISREL statistical software showed that intellectual capital and its components have direct effects in promoting KM processes in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province). By improving intellectual capital and its indexes, knowledge management can be improved.

Keywords: Intellectual capital; Human capital; Structural capital; Customer capital; Knowledge management

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1. Introduction

Organizations today are faced with different challenges to be at par or even better than their counterparts globally. The leading organizations make use of management tools and new technologies to take advantage of the opportunities and to strategically achieve organizational goals. However, the purpose of this proactive approach is not only technological and equipment readiness, organizations need to make their employees future ready (Abdollahi & Nave Ibrahim, 2006). With the emergence of organizational development interventions, relations between employees and agencies have become more complex. With continuous displacement of employees, the most important asset of the organization, its knowledge, is in danger. Vital knowledge created through these relationships will be ruined in the absence of effective management. The possibility of the risk for this tacit knowledge is more than explicit knowledge (Fei, Meng, & Yoshiteru, 2001). The Organizations are realizing the increasing importance of knowledge as it has become one of the most important factor in determining success and sustaining competition. This has resulted in the formation of knowledge based economies and management of knowledge has become the most fundamental task in an organization (Monavarian & Asgari, 2009). As a result, organizations are striving to become learning platforms wherein knowledge can be created, maintained, transferred and applied to activities that boost performance (Lee & Choi, 2003). Knowledge management refers to systematic efforts engaged to find, organize and increase accessibility of intellectual capital in an organization thereby strengthening the culture of learning and knowledge sharing (Cappelli, 2000). Many organizations focusing on knowledge management and extensive investment in IT are trying to improve their performance by implementing knowledge management (Rastogi, 2000). Organizations are adopting a two phase approach to improve productivity and organizational effectiveness. In the first phase, impetus is given to technology upgradation wherein state of the art hardware is installed and updated IT tools are employed. In the second phase, social human factors are considered as they are gaining attention in an organizational setup. Hence, efforts are focused on integrating hardware, software and brain ware. From Davenport and Prusak's (1998) point of view, most organizations have taken primary technological steps to upgrade technology and associated equipments that are required to improve level of organizational productivity. But constantly they have arrived at a situation where no extra value is added. Reversing this situation requires major changes focusing on key aspects such as culture, structure and other social areas including benefiting organizational capitals (Davenport & Prusak, 1998). A change in the behaviour, beliefs and attitudes of members at all levels is required to gain competitive advantage and to sustain productivity. Purchasing new technological equipments and reframing the traditional phenomena will not bring change in attitudes and behaviour. There is a need to have a comprehensive approach which pays attention to social human factors as well as hardware requirements. For descriptions of these factors, the term "Intellectual capital" can be used. It is a concept that combines intangible property markets, intellectual property, human property and infrastructure property that an organization makes to perform its activities. Research in the concerned field has indicated that a lot of investigation has been done on the concept of intellectual capital and its indexes and also on the concept and processes of knowledge management. But still what is indisputable is that organizations and companies are looking for something beyond it. Nowadays, organizations are pondering on the relationship between successes of knowledge management initiatives in achieving competitive edge. The question that arises is: Can

we create differentiation and superior competitive advantage by implementing Intellectual Capital in Knowledge management projects? Accordingly, research on the role of intellectual capital in promoting the success of knowledge management initiatives with focus on different knowledge management processes such as creation and knowledge acquisition, knowledge retention, transfer and sharing of knowledge, use and application of knowledge seems necessary. Thus the aim of this paper is to investigate the role of intellectual capital in promotion of successful knowledge management initiatives in the subsidiary companies of Ministry of Energy (Sistan & Baluchestan Province) and responding to the fundamental question whether there is a relationship between intellectual capital and knowledge management or not?

2. Literature review

2.1. Intellectual capital

The term Intellectual capital (IC) was first introduced by John Kenneth Galbraith in 1969, who mentions the difference between an organization's market value and book value (Curado, 2008). Intellectual capital, as the most important asset in organizations is a term commonly used across various fields of academic and managerial activity. It is related to, and sometimes interchangeable with, terms such as 'knowledge capital', 'knowledge economy' and 'intangible assets' (Gowthorpe, 2009). According to Striukova, Unerman, and Guthrie (2008), in many sectors, knowledge management and intellectual resources are increasingly important factors in the successful achievement of organizational objectives. The IC theoretical studies indicate that IC comprises of three components: structural capital, human capital, and customer/relational capital (Curado, 2008; Keong Choong, 2008; Sveiby, 1997; Edvinsson & Malone, 1997; Bontis, 1998; Sullivan, 2000; Mouritsen, Nikolaj Bukh, & Marr, 2004; Rodriguez Perez & Ordóñez de Pablos, 2003; McPhail, 2009; Taghizadeh & Zeinalzadeh, 2012). Human capital is summed up by three factors: ability, satisfaction, and stability of the staff (Moon & Kim, 2006; Pearse, 2009). This capital is, in fact, the most important form of intellectual capital in an organization, because it is the main source of creativity and innovation (Norma, 2005). Structural capital consists of non-human storehouses of knowledge in a firm that make up an organizational structure, For instance, organizational routines and the structure of the business (Taghizadeh & Zeinalzadeh, 2012). Customer/Relational capital represents as knowledge created form all relations between the organization and customers, competitors, suppliers, commercial committees, or government (Andriessen, 2005).

2.2. Knowledge management

Knowledge has long been considered an important organizational asset, and its effective management is, therefore, crucial to survival and success in the competitive environment. Knowledge Management (KM) as a term was first presented by Wiig (1986). Scientists and researchers have proposed different definitions for knowledge management (Beckman, 1997; Uit Beijerse, 1999; Chorafas, 1987; Ordonez de Pablos, 2002; Bhatt, 2001; Maglitta, 1995; Willett & Copeland, 1998). There are variations in the definition of knowledge management beacuse some definitions focus on knowledge management processes while others focus on the objectives to be achieved.

Based on the literature reviewed, four dimensional procedure of knowledge management (Nonaka, 1994) is considered as dependent variable and intellectual capital

(human, structural and customer capitals) is considered as an independent variable. Fig. 1 shows a conceptual model of the study.

The dimensions of knowledge management that reflect on the overall process of KM are investigated in Table 1. It is a brief analysis of the viewpoints of various authors at different points in time. Analysis of the table depicts that four processes were the most important and vital. Creation and knowledge acquisition, knowledge retention, transfer and sharing of knowledge, and use and application of knowledge. This analysis is quite similar to the one proposed by Nonaka (1994) in the four dimensional procedure of knowledge. Therefore, we can infer that these four attributes of knowledge management improves the performance and competitive advantage in organizations.

Table 1
The knowledge management processes

Source / process	Creation and knowledge acquisition	Identification and Selection	Save and organize	Refinement and processing	Knowledge transfer and sharing	Knowledge application
Alavi & Leidner (2001)	*		*		*	*
Shin, Holden, & Schmidt (2001)	*		*		*	*
Allameh, Zare, & Davoodi (2011)	*		*		*	*
Apostolou & Mentzas (1998)	*			*	*	
Ward &Aurum (2004)	*	*	*		*	*
Hackett (2000)	*		*		*	*
Herder, Veeneman, Buitenhuis, & Schaller (2003)	*		*		*	*
Chang & Chuang (2011)	*	*	*		*	
King, Chung, & Haney (2008)	*		*	*	*	*
Wiig (2002)	*		*		*	*
Marr & Spender (2004)	*		*	*	*	*
Jashapara (2004)	*		*		*	*
Aurum, Daneshgar, & Ward (2008)	*	*	*		*	*

3. Previous research

Some researches which focus on the four major attributes of knowledge management are as follows:

Bontis (1998) indicated that there is a reciprocal relationship between the indexes of intellectual capital and human capital. All the dimensions of intellectual capital (human, structural and customer capital) have positive effects on business performance. Rastogi (2000) explained knowledge management and intellectual capital as new virtuous reality of competitiveness. Choo and Bontis (2002) presented a visual model for strategic knowledge. In this model the role of intellectual capital in knowledge management is presented. Zhou and Fink (2003) established similarities between the two terms to

developed a systematic approach linking knowledge management (KM) with intellectual capital (IC) through the Intellectual Capital Web (ICW). Mouritsen and Larsen (2005) provided a method to analyze (and design) intellectual capital information so that it can be used to manage knowledge resources. Apart form that, it also showed that the information gained from creation and application of intellectual capital in an organization is a great help to control and manage knowledge. Lee, Lee, and Kang (2005) presented a new metric, Knowledge Management Performance Index (KMPI), for evaluating the performance of a company in its knowledge management (KM) at a point in time. Chu, Lin, Hsiung, and Liu (2006) attempted to establish a relationship between indexes of intellectual capital. Curado (2008) explored the perceptions of knowledge management and intellectual capital in the banking industry. Isa, Abdullah, Hamzah, and Arshad (2008) proposed a typology of intellectual capital and knowledge management in Malaysian hotel industry. Hamzah and Ismail (2008) argued that intellectual capital management should be injected in an organization's strategic management process at the implementation phase. Tai and Chen (2009) provided an appropriate model for intellectual capital performance assessment by combining 2-tuple fuzzy linguistic approach with multiple criteria decision-making. Hsu and Fang (2009) examined the relationship between intellectual capital and organizational learning capability. Ngai and Chan (2005) presented a method for selecting the most suitable tool to support knowledge management (KM) by using Analytic Hierarchy Process (AHP). EmamiSaleh, Ardalan, and Valipour (2012) investigated the relationship between intellectual capital and knowledge management performance. Salmaninezhad and Daneshvar (2012) examined the effects dimensions of of intellectual capital on success of knowledge management success in Tehran Science and Technology Park. Taghizadeh and Zeinalzadeh (2012) investigated the role of knowledge management and creativity on intellectual capital.

4. Theoretical framework of the research

Theoretical studies of this research are mainly based on the Bontis, Chua Chong Keow, and Richardson (2000) theories regarding intellectual capitals and the theory of knowledge management by some researchers (O'Dell & Grayson, 1998; Newman & Conrad, 1999; Hals, 2001; Shin, Holden, & Schmidt, 2001; Alavi & Leidner, 2001; Allameh, Zare, & Davoodi, 2011; Apostolou & Mentzas, 1998; Ward & Aurum, 2004; Jashapara, 2004; Chang & Chuang, 2011; King, Chung, & Haney, 2008; Wiig, 2002; Marr & Spender, 2004). The conceptual model of the research shown in Fig. 1 represents the role of intellectual capital (human capital, structural capital, and customer capital) on knowledge management processes (creation and knowledge acquisition, knowledge retention, transfer and sharing of knowledge, use and application of knowledge). Based on this model, the independent variable is intellectual capital and its components and dependent variable is knowledge management which includes the most important processes such as creation and knowledge acquisition, knowledge retention, transfer and sharing of knowledge and, use and application of knowledge. The research assumptions are presented below:

H1: Positive and meaningful relation exists between intellectual capital and successful knowledge management initiatives in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province).

H1-1: Positive and meaningful relation exists between human capital and successful knowledge management initiatives in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province).

H1-2: Positive and meaningful relation exists between structural capital and successful knowledge management initiatives in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province).

H1-3: Positive and meaningful relation exists between customer capital and successful knowledge management initiatives in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province).

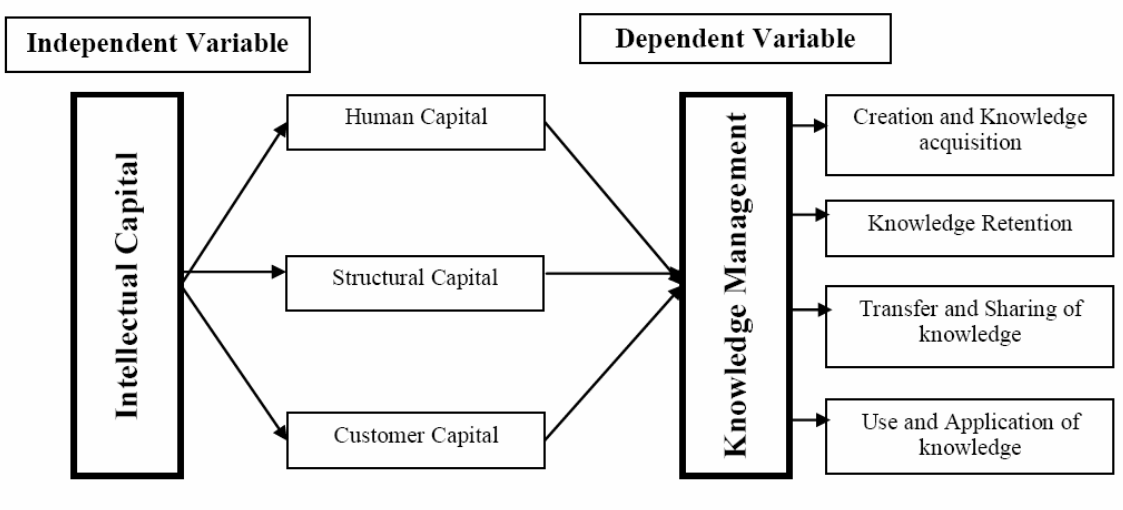

Fig. 1. The proposed conceptual model of the research

5. Research methodology

This paper is an effort to design a model for evaluating the role of intellectual capital in promoting the success of knowledge management initiatives in organizations. Hence, the research is descriptive in nature. In addition, a questionnaire was used to gather necessary data. Therefore, this research is considered as a survey research. For investigating and testing hypotheses and model, the Structural Equations Model (SEM) by Lisserel statistical software has been used. The statistical focus group for this research is all managers and experts in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province) which includes 200 individuals. The volume of statistical sample is 132 individuals. They are selected by simple random sampling by using the following equation:

$$n = \frac{N.z^2_{\frac{\alpha}{2}}.P(1-P)}{(N-1).\varepsilon^2 + z^2_{\frac{\alpha}{2}}.P(1-P)} = \frac{200 \times (1.96)^2 \times (0.5 \times 0.5)}{199 \times (0.05)^2 + (1.96)^2 \times (0.5 \times 0.5)} \simeq 132$$

In order to access 132 correct and faultless responses, 140 questionnaires were distributed. After collecting the filled questionnaires, it was found that 120 were appropriate.

The tool for gathering the data in this research is questionnaire. The four dimensional procedure of knowledge management (Nonaka, 1994) is taken into

consideration while developing the questionnaire. These dimensions for knowledge management are: Creation and knowledge acquisition, knowledge retention, transfer and sharing of knowledge, use and application of knowledge (Gold & Arvind Malhotra, 2001; Zheng, 2005); and for intellectual capital are: human capital, structural capital and customer/relational capital (Bontis, Chua Chong Keow, & Richardson, 2000; Bontis, 2002; 2004; Leap & Loughry, 2004; McPhail, 2009).

A Five-point Likert Scale is used to rate preferences of the respondents in the questionnare.Both intellectual capital and knowledge management pespectives are taken care of in the statements. The prefernces on the Likert Scale is rates as follows:

1) totally disagree
2) disagree
3) no idea
4) agree and
5) totally agree

The views and recommendations of expert authorities, professors and a number of the organization's executives in the research field have been taken to design a valid questionnaire. In addition, to investigate construct validity, factor analysis has been conducted. The researcher's decision to accept or reject an indicator is also guided by factor analysis. To check reliability of the questionnaire Cronbach's Alpha coefficient is used. The computed Cronbach's alpha for the questionnaire is 0.727. The details of Cronbach's alpha result are presented in Table 2.

Table 2
The Cronbach's alpha coefficient of research variables

Name of variable	Cronbach's alpha	Number of question
Creation and knowledge acquisition	0.701	4
Knowledge retention	0.78	3
Transfer and sharing of knowledge	0.744	5
Use and application of knowledge	0.795	4
Human capital	0.7	8
Structural capital	0.755	10
Customer capital	0.754	6
Questionnaire	0.727	40

6. Data analysis and discussion

After collecting the data, Kolmogorov-Smirnov test has been employed to test for normality. The test and its result have been presented in Table 3.

While testing the normality of the data, null hypothesis (H0) is that the data follows a normal distribution and the alternative hypothesis implies against this. It can be inferred by the results shown in Table 3. P-Value computed for each of the five variables namely human capital, structural capital, customer capital, knowledge management, and

intellectual capital is less than 0.05 and the alternative hypothesis is accepted. Consequently, the normality of the data is rejected.

Table 3
Test for the normality of the variables

Name of variable	HC	SC	CC	IC	KM
Sample Size (n)	120	120	120	120	120
Mean	31.7583	39.0667	23.9000	94.7250	61.8833
Std. Deviation	3.98526	4.40346	3.36916	7.86543	6.94901
Kolomogorov-Smimov Z	1.543	1.859	2.133	1.616	1.751
Asymp. Sig. (2-tailed)	.017	.002	.000	.011	.004

Therefore, due to the lack of normal data, Spearman rank correlation has been used. Table 4 indicates the output of SPSS using Spearman rank correlation.

Table 4
Output of Spearman rank correlation for variables

Correlations			KM	IC	HC	SC	CC
Spearman's rho	**KM**	Correlation Coefficient	1.000	.560	.436	.410	.356
		Sig. (2-tailed)	.	.000	.000	.000	.000
		N	120	120	120	120	120
	IC	Correlation Coefficient	.560	1.000			
		Sig. (2-tailed)	.000	.			
		N	120	120			
	HC	Correlation Coefficient	.463		1.000		
		Sig. (2-tailed)	.000		.		
		N	120		120		
	SC	Correlation Coefficient	.410			1.000	
		Sig. (2-tailed)	.000			.	
		N	120			120	
	CC	Correlation Coefficient	.356				1.000
		Sig. (2-tailed)	.000				.
		N	120				120

According to the results of the test shown in Table 4, the correlation coefficient between intellectual capital and its indexes and knowledge management are respectively .560, .463, .410 and .356. Considering the significance level (p), P-Value computed for all the five variables is less than 0.01. Therefore null hypothesis (H0) is rejected. Consequently, the non-normality of the data is approved. Therefore, the relationship between the components of intellectual capital in promoting success of knowledge management is positive and significant. Since correlation coefficients are having a positive sign,it is concluded that all variables are moving in the same direction and there exists a positive relationship. It shows that by increasing the intellectual capital and its components, knowledge management can be improved (and vice versa).

Before testing the hypotheses, evaluation models must be made accurate. Factorial models act as evaluation models in structural equations models. Evaluation

models related to factor analysis, that were extracted using Structural Equations Models and Lisserel software, are shown in Fig. 2 & 3. The vital aspects of the model of intellectual capital include structural capital, human capital, and customer capital. The main parts of knowledge management model include creation and knowledge acquisition, knowledge retention, transfer and sharing of knowledge, and use and application of knowledge. As the results of Table 6 demonstrate, all the criteria fit appropriately well. The models have a suitable level of fitness so the measurement models are appropriate for building the structural equations model.

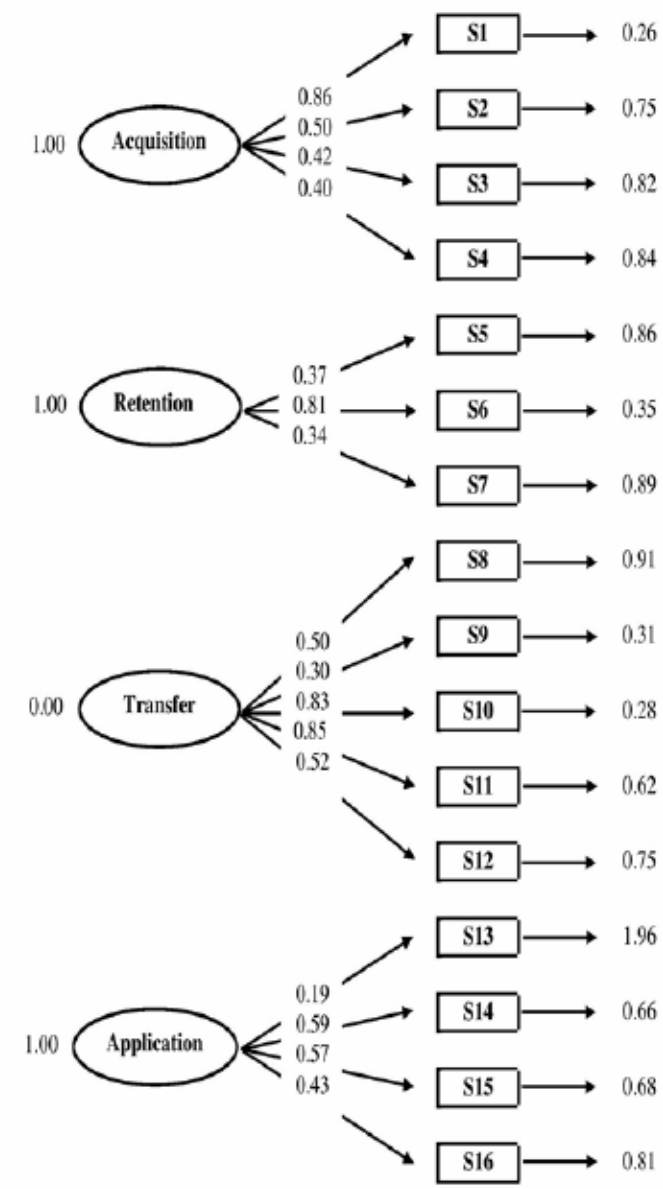

Fig. 2. The model of the evaluation of knowledge management in a standard estimate. Chi-square=8.02; df=3; P-value=0.01811; RMSEA=0.059

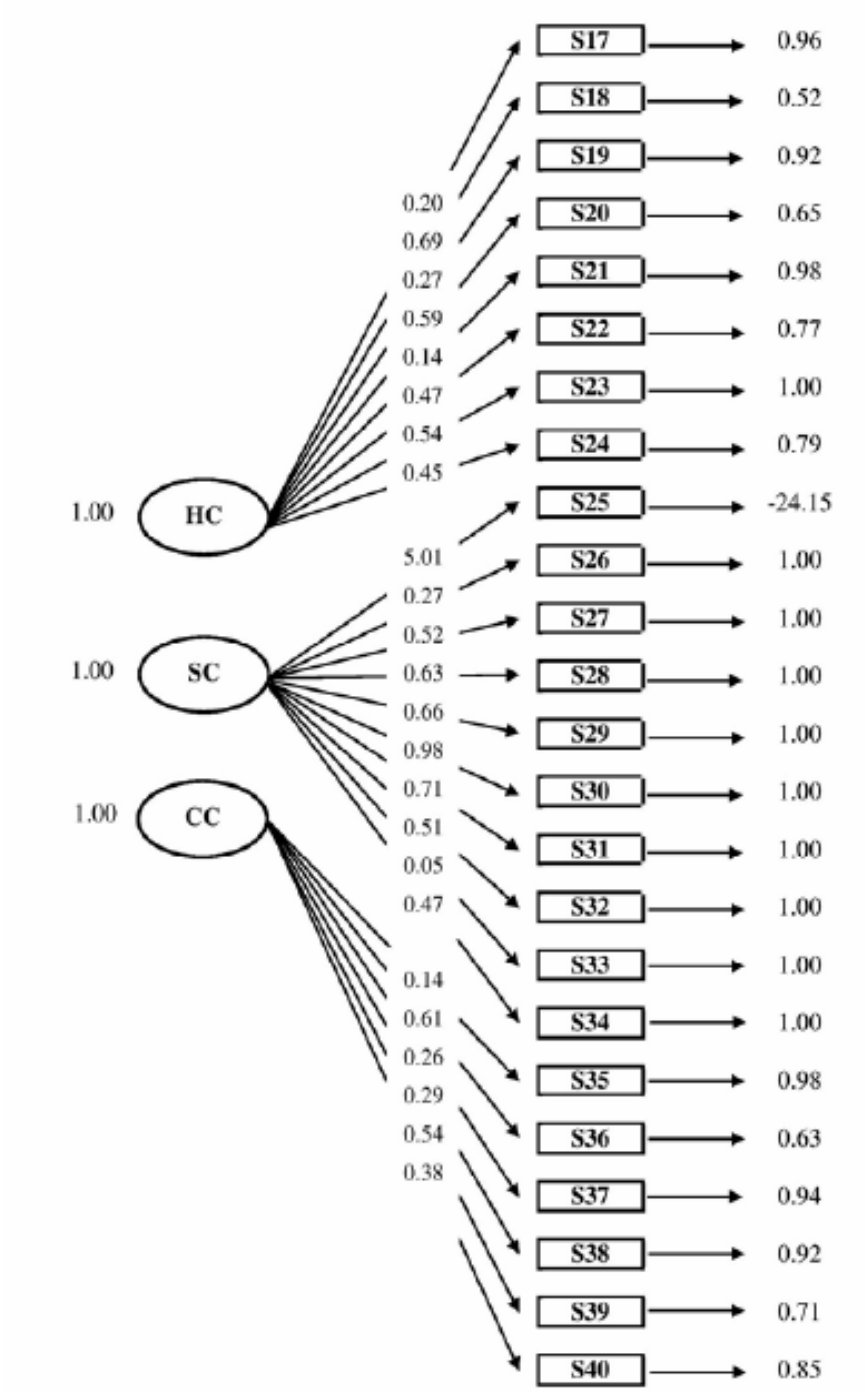

Fig. 3. The model of the evaluation of intellectual capitals in a standard estimate. Chi-square=1070.04; df=449; P-value=0.00000; RMSEA=0.066

Table 5
Fitness indicators for research model

Fitness indicator	Criterion for acceptance	Model the impact of IC on KM	Model the impact of HC on KM	Model the impact of SC on KM	Model the impact of CC on KM
x^2/df	$x^2/df \leq 3$	2.67	2.97	2.98	3.06
R	-	0.89	0.51	0.62	0.52
T-Value	1.96 ≤ T-Value	4.32	2.98	6.11	7.23
x^2	-	42.87	187.7	174.71	104.16
df	-	16	63	76	34
RMSEA	RMSEA ≤ 0.08	0.039	0.046	0.082	0.032
GFI	0.90 ≤ GFI	0.91	0.93	0.91	0.95
AGFI	0.90 ≤ AGFI	.88	0.88	0.89	0.91

According to the results of the test shown in Table 5, the output of Lisserel shows that all the criteria of complete fitness of the comprehensive model of research have been fulfilled. The ratio of Chi-2 to the degree of freedom is less than 3 and RMSEA is less than 0/08. NNFI and GFI are also higher than 90%. So, the structural equation model of research (Fig. 4) can be used to test the hypotheses of the research. The results pertaining to hypothesis testing have been summarized in Table 6. Column of the coefficient of effect relationship indicates the influence of a structure on another structure in the conceptual model of the research. In fact, the coefficient of effect indicates the magnitude of effect or determines the effects of one variable on another variable. Significance level also shows the meaningfulness of each effect. For being meaningful, the number must be below -2 or above +2.

Table 6
The results obtained of testing the hypotheses of the research

Hypotheses of the research model	**Coefficient of relationship**	**Test results**
H1-1: Positive and meaningful relation exists between human capital and successful knowledge management initiatives in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province).	0.51	Accepted
H1-2: Positive and meaningful relation exists between structural capital and successful knowledge management initiatives in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province).	0.62	Accepted
H1-3: Positive and meaningful relation exists between customer capital and successful knowledge management initiatives in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province)..	0.53	Accepted
H1: Positive and meaningful relation exists between intellectual capital and successful knowledge management initiatives in the subsidiary companies of Ministry of Energy of Islamic Republic of Iran (Sistan & Baluchestan Province).	0.89	Accepted

Considering the statistical results of hypothesis 1-1, (where standard coefficient is 0/51 and significance level of 4/32), it is evident that human capital has a positive and meaningful effect on facilitating knowledge management. The data and results of statistical analysis of hypothesis 1-2 (with standard coefficient of 0/62 and significant level of 6/33), approves the hypothesis, thereby inferring that structural capital has a meaningful and positive effect on facilitating knowledge management. Also, the statistical results of hypothesis 1-3 (with standard coefficient of 0/53 and significant level of 7/23), represent the approval of hypothesis, hence concluding that customer capital has a meaningful and positive effect on facilitating knowledge management. Finally, considering the results of the respective hypothesis, the main hypothesis (with standard coefficient of 0/89 and significant level of 4/32), is also approved. Therefore, it is concluded that intellectual capital has a meaningful and positive effect on facilitating knowledge management.

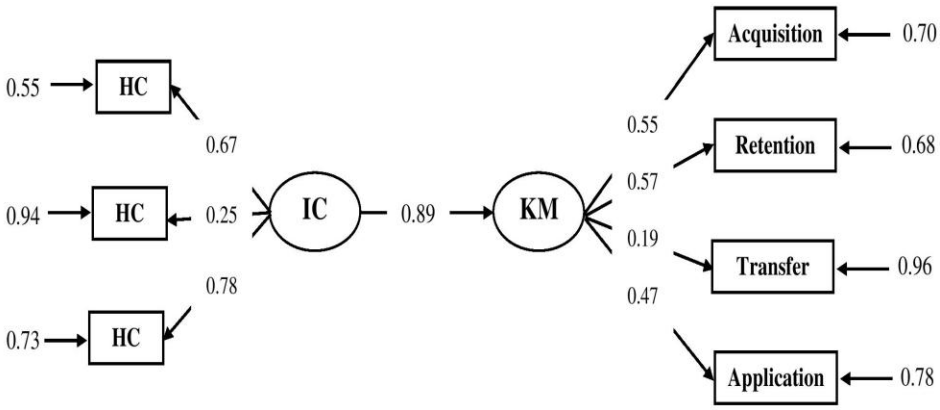

Fig. 4. Structural equation model of the effect of intellectual capital on knowledge management. Chi-square=42.87; df=16; P-value=0.00005; RMSEA=0.039.

In the end, as far as Table 6 is concerned, it was determined that Chi square is 42.87, P = (0.00005) and $\chi 2/df = 2.67$. Considering that the acceptable level for all the indices was obtained, it is deduced that the model fitted well and the proposed model is acceptable.

7. Conclusion

In this paper, a model has been designed to evaluate the role of intellectual capital in promoting success of knowledge management in the subsidiary companies of Ministry of Energy (Sistan & Baluchestan Province). The research model is based on intellectual capital indexes (human capitals, structural capitals, customer capitals) which is an independent variable and knowledge management components (creation and knowledge acquisition, knowledge retention, transfer and sharing of knowledge, use and application of knowledge), which is a dependent variable. So far, no research regarding the role of intellectual capital in promoting the success of knowledge management has beed done in Iranian organizations. The researcher tried to evaluate the role of intellectual capital in facilitating knowledge management in the subsidiary companies of Ministry of Energy (I.R.I), providing an important and valuable result. The research model can be an initial point of reference for facilitation and enhancement of knowledge management in Iranian

public organizations which is predicted in the fourth development Plan and a twenty-year vision.

Moreover, this study is important because of the prominence of knowledge-based organizations in the 21st century and the development of knowledge economies. Therefore, the organizations are paying a great attention to their intellectual capital. The Iranian government is giving priority to core knowledge in its fourth development plan and in its twenty year vision it is striving to achieve rank A in social, economic and cultural dimensions in the Middle East by 1404. Therefore, the Iranian government has called the fourth development Plan as " Development of knowledge-based economy with an emphasis on global interaction".In order to unify intellectual capital and its components with knowledge management, intellectual capital constructs considering strategic needs of organizations should be led to increase the available processes on knowledge management processes.

In short, the results regarding the role of intellectual capital and its indexes have a significant positive relationship with knowledge management and it promotes the success of knowledge management initiatives. Thus, by increasing and improving the components of intellectual capital, knowledge can be managed effectively. According to theoretical research and the studies conducted by the researcher, it can be concluded that intellectual capital and its indexes as independent variables and knowledge management as dependent variable are complementary to each other and both of them hold vital importance in all the activities of an organizations right from knowledge creation to knowledge usage.

In order to improve intellectual capital, we provide the following recommendations on three different aspects:

a) In order to strengthen each of the human capital component, the following recommendations are provided:

- Designing a competency framework of employees and managers including their knowledge, skills, and their abilities and competency.
- A continuous measurement of competency level of employees and use of programs like succession planning at different organizational levels.
- Ongoing assessment of employee's performance during a certain period and analysis of obtained results by measuring employee's performance and comparing them with standards and measures such as incentives and punishment.
- Designing a system of support and encouragement for highly intellectual employees in order to implement their knowledge timely in the organization's operational processes and giving them an appropriate360 degrees feedback.
- Establishing a continuous measurement system for job satisfaction of employees in an organization.

b) To strengthen each part of structural capital (organizational structure, organizational culture, operational process, and etc.) the following suggestions are provided:

- Using advanced team and project structures in different areas of organization.
- Identifying and documenting key processes that have the highest value for the customers, and identifying and implementing domestic and international rivals' experience.

- Assigning more fund and time for research and operational development and cooperation and interaction with authorities and scientific associations and the use of information systems that makes it easy to access information.
- Asking for suggestions inside and outside the organization in order to get comments of employees and customers respectively.

c) *To strengthen the relationship between every component of relational capital (fundamental capability of marketing, market intensity and customer loyalty) suggestions are provided below:*

- Training the employees and individuals who have a direct relationship with customers, in appropriate behavioral skills.
- Continuously tracking the expectations and responding to the complaints of the customers in a timely manner and automating certain customer affairs.
- Implementing strategic planning to identify opportunities and threats in the external environment and internal strengths and weaknesses while going in for contracts and agreements.

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