

Analyzing the Mediating Role of Organizational Innovation on the relationship between Knowledge Management and Organizational Entrepreneurship

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Abstract

Inevitably, in the dynamic organizations, innovation and entrepreneurship are important for preserving competitive advantages and knowledge management facilitates this relationship. The aim of the present study was to investigate the role of knowledge management on organizational innovation and entrepreneurship. The research was an applied study in terms of the aim of study and a descriptive-correlation in terms of the research method. The population of the study included the staff of Sepahan Battery Industrial Complex as more than 800 individuals in 2015. From among this population, 260 participants were randomly selected. The research instruments for collecting data were questionnaire, the results of the analysis of the questionnaires and testing the hypotheses by Smart-PLS indicated that the variable of knowledge management is directly effective on organizational entrepreneurship, but has indirect effects on organizational entrepreneurship via the mediating role of organizational innovation.

Keywords: Organizational innovation, Organizational entrepreneurship, Knowledge management.

1. Introduction

In the dynamic and complicated world of today, development and survival of organizations depend on factors such as ability, creativity, and innovation and entrepreneurship. In the past years, one of the interdisciplinary concepts which have become familiar in organization is entrepreneurship. Using these concepts, organizations adopt new methods for doing affairs, leadership, motivation, and control. Joseph Schumpeter considers entrepreneurship as the main driving force in economic development and knows its role as innovation or “creation of the composition of new materials”. In most researches, it has been indicated that entrepreneurship results in sustainable development and economy (Kardos, 2012, p. 1031). Kirzner (1973) defines entrepreneurship as awareness of undiscovered profitable opportunities. Surely, entrepreneurship does not have any sense without innovation. In other words, entrepreneurship means providing innovative solutions for unsolved social issues (OECD, 2010). The effects of entrepreneurial organizational practices on organization performance and success induced researchers to perform different studies about related organizational factor (Yeazdanshenas, 2014, p. 374). According to Schumpeter (1934), organizational entrepreneurship is a term originates from the business world and is considered as the ability to use the resources with new methods resulting in creating new products or services or establishing new units in organizational environments (Alvani et al. 2013, p. 5). Other researchers that have investigated this concept are Wickham (2001), Antonic and Hisrich (2003), Sathe (2006), Hitt et al. (2002) and Yilmaz (2013). To investigate organizational entrepreneurship, and different models were used. In the present study, the model developed by Antonic & Hisrich (2003) was employed.

Innovation is important not only for keeping companies' credit, but also for the effect on social and economic changes, preserving competitive advantage, surviving organizations, and improving their performance (Kalmuk & Acar, 2015, p.165). Innovation causes the increase in the quality and reduction of costs and the completion of the production process in organizations. Subramaniam & Youndt (2005, p.454) define organizational innovation as the identification and use of new opportunities for creating new products, services, or working activities. Innovation and creativity are factors of the advent of organizations, increase in quality and quantity, diversity of products and services, the reduction in costs, losses and waste of resources, increase in motivation, the promotion of mental health and job satisfaction of employees, improvement in productivity, growth and development of organizations, and the creation of competition (Katila & Shane, 2005, p.815). To investigate and create innovation in organizations, different models are employed. In the present study, the model of Jiménez et al. (2008) was used. According to this model, organizational innovation can be investigated in three productive, process, and administrative dimensions.

Knowledge management includes all methods by which organizations manage all of its own knowledge properties. These methods include how to collect, store, transfer, apply, update, and create knowledge (Wickramasinghe & Lubitz, 2007, p. 102). According to Haney (2003), knowledge management is a scientific field of study which encourages and reinforces the method of dealing with bilateral support for creating, seizing, organizing, and using information. Kim et al (2003, p. 44) argue that “*Maintaining knowledge is more difficult than*

creating knowledge; promotion of knowledge sharing culture is indispensable; top management support on knowledge management project is inevitable; reward system is clearly declared to enhance knowledge sharing; knowledge management system should satisfy knowledge requirements” (cited by Hamza, 2008). To assess the feasibility and operationalization of knowledge management, different models are used as well. Nonaka & Takeuchi (1995) proposed a model covering different kinds of knowledge and indicating levels of knowledge and converting them into each other explicitly and separately. This model, contrary to other models, focuses on two kinds of explicit and implicit knowledge and pays attention to the mode of conversion of them into each other and how to create them in all organizational (personal, group, and organizational) levels. In this model, the way to use and convert these two forms of knowledge into each other and quiddity of knowledge management in this relation is assumed spirally and in a continuous process (Cristea & Capatina, 2009, p; 358). Nonaka & Takeuchi (1995) conducted a research in Japanese companies which had creativity and innovation and focused on this feature for presenting this model (Cristea & Capatina, 2009).

Innovation and entrepreneurship are the two selected arms for fighting against complicated and variable environmental conditions. Nowadays, big and small organizations have found the role and significance of these two issues for obtaining competitive advantage and have been trying to achieve them. The influence of knowledge management in innovation and entrepreneurship in organizations should not be neglected because knowledge is considered as one of the resources of competition for organizations and the objective of knowledge management is to use the potential ability of companies in learning the developing innovations (Gunsel et al. 2011, p.885). Although investigations indicate that in recent studies the mediating role of knowledge management in innovation and entrepreneurship has not been considered, authors and researchers such as Zaided, Louat & Affes (2015,p.58), Hamel(2006), and Gundayet al.(2011) believe in the direct and indirect relationship among these three concepts.

Sepahan Battery Industrial Complex (SBIC) was founded in 1999 as the most hi-tech enterprise in automotive battery manufacturing in Iran. It is located in Oshtorjan industrial zone, Isfahan, Iran. SBIC's annual production capacity is 3.6 million batteries, and it is planned to be increased further by introduction of a number of capacity alignment activities. SBIC'sas one of the important and vital elements in the field of production of a diverse range of plates, equipment, components, body molding and accessories of different batteries and as one of the prominent and superior companies known in battery manufacturing has a great role in Iran's economic development.

Heads of the company believe that importing technology in the form of machinery, which leads to assembly, is a failed strategy that had inflicted the Iranian economy with routineness and has diminished its tolerance against pressures of the environmental factors. This company is looking forward to increasing the quality of its products so as to upgrade its share in national production, via which it would step forward not only in resistance economy, but also act beyond local markets and thus enter the world market. Thus, according to new competitors in the industry, the development of the company depends on constantly offering

new services and creating value through innovation and entrepreneurship. Entrepreneurs need to realize the innovation system and catalytic processes (facilitator), such as knowledge management. Implementation of knowledge management process through the updating of data and information, there would be created an environment to facilitate innovation and entrepreneurship. So the aim of the present study is to investigate the Mediating Role of Organizational Innovation on Knowledge Management and Organizational Entrepreneurship.

2. Background Research

Table 1 compares certain researches on three variables of innovation, entrepreneurship and knowledge management.

Table 1: Background Research

Researchers	Topic	Results	References
Miller, Friesen (1982)	Innovation in conservative and entrepreneurial firms: two models of strategic momentum	Negative correlations are predicted between innovation and the variables that can provide such warning.	Strategic Management Journal, 3: 1-25.
Roberts&Am it, (2003).	The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981---1995	Banks that undertook more innovative activity, that were more consistent in that activity, and whose composition of activity was somewhat differentiated from the industry norm tended to display superior financial performance.	Academy of Management Journal, 27(1), 25-41.
Zhang, (2011)	Firm-level performance impact of IS sup-port for product innovation.	Providing IS support for product innovation alone did not improve profitability as measured by return on sales and return on assets. Only when complemented by firm-specific information and knowledge would IS support for product innovation lead to profitability gains	European Journal of Innovation Management, 14(1), 118-132.
Goodale et al.(2011)	Operations Management and Corporate Entrepreneurship: The	Only two of the five antecedents to corporate entrepreneurship have main effects on innovation performance with moderate	Journal of Operations Management, 29: 116-127.

	<p>moderating effect of operations control on the antecedents of corporate entrepreneurial activity in relation to innovation performance</p>	<p>significance.</p>	
Paul (2012)	<p>The role of external knowledge in open innovation- A systematic Review of literature</p>	<p>selecting external sources of knowledge is one of the main challenges of open innovation</p>	<p>Proceedings of the European Conference on Knowledge Management, p592.</p>
Lisetchi and Brancu(2013)	<p>The entrepreneurship concept as a subject of social innovation</p>	<p>There is relation between the two concepts of innovation and social innovation by exploring the “socializing”</p>	<p>Procedia - Social and Behavioral Sciences 124 (2014) 87 – 92</p>
Naranjo-Vale nciaet al.(2015)	<p>Studying the links between organizational culture, innovation, and performance in Spanish companies</p>	<p>Culture can foster innovation, as well as company performance, or it could also be an obstacle for both of them, depending on the values promoted by the culture. It has been found specifically, that an adhocratic culture is the best innovation and performance predictor. Innovation mediates the relationship between certain types of organizational cultures and performance.</p>	<p>Revista Latinoamericana de Psicología (2015), http://dx.doi.org/10.1016/j.rlp.2015.09.009</p>
Tantau et al.(2015)	<p>Corporate Entrepreneurship and Innovation in the Renewable Energy Field</p>	<p>management support for corporate entrepreneurship and work autonomy are the organizational Factors that would support innovation in these diversifying companies the most.</p>	<p>Procedia Economics and Finance 22:353 – 362</p>

Ben Zaied et al.(2015)	The Relationship Between Organizational Innovations, Internal Sources of Knowledge and Organizational Performance	There is relationship between internal and external sources of knowledge with organizational innovation and organizational performance and there is relationship between organizational innovation and organizational performance.	International Journal of Managing Value and Supply Chains (IJMVSC) Vol. 6, No. 1, March 2015
Huang And Chelliah(2015).	Entrepreneurial Organization and Organizational Learning on SMES' Innovation.	Organizational learning, in turn, positively moderates Entrepreneurial orientation–innovation relationship.	The International Journal of Organizational Innovation, 7(3), 65-75.
Safarzade et al.(2015)	Investigation of the effect of organizational Entrepreneurship atmosphere on organizational innovation	The atmosphere of organizational entrepreneurship has a meaningful effect on the organizational innovation of general office of economy and finance in Golestan province.	Journal of Applied Environmental and Biological Sciences, 5(9S)174-179
Findikli et al(2015)	Examining Organizational Innovation and Knowledge Management Capacity	Their results clearly differentiated between the effects of various strategic human resources practices over organizational innovation and knowledge management capacity.	Procedia - Social and Behavioral Sciences 181 (2015) 377 – 387

3. Research Conceptual Model and Hypotheses

Figure (1) shows research conceptual model. In this model, we used three variables that conclude knowledge management, organizational innovation and entrepreneurship. Also, according to the conceptual model, a main hypothesis and three secondary hypotheses are to be investigated in the present study.

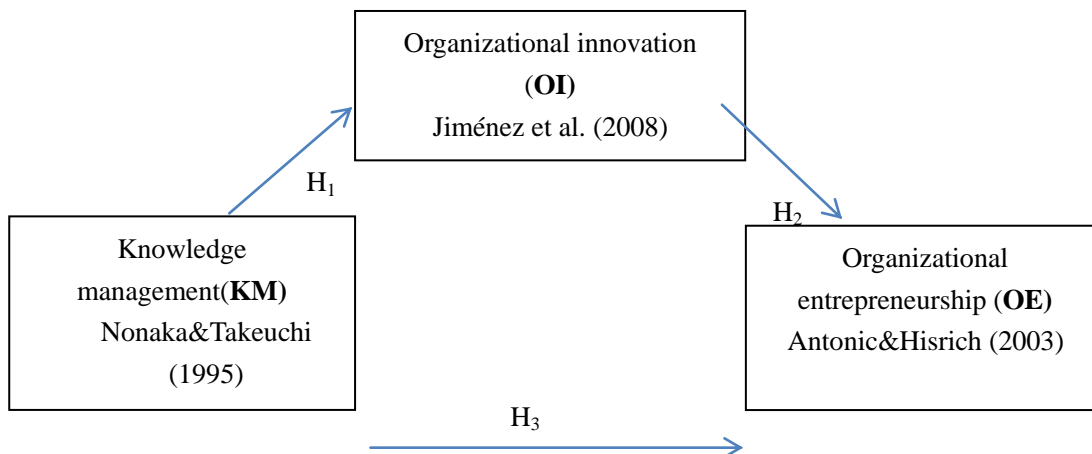


Figure 1: The Research Conceptual Model

3.1. Main Hypothesis

Organizational innovation has a mediating role on relationship between knowledge management and organizational entrepreneurship of the staff of Sepahan Battery Industrial Complex (approving the conceptual model).

In recent decades, entrepreneurial activities have penetrated into organizations and managers have paid increasing attention to entrepreneurship in order to innovate and commercialize products and services. But, Kroeger (2007) indicated that 56% of entrepreneurial businesses are bankrupted in the first four years of starting their activities. Nonaka believes that in the current conditions, where only confidence is not to be confided, knowledge management guarantees the success and survival of organizations (Madhoushi et al.2010, p. 57). Therefore, it seems that the relationship between innovation and entrepreneurship can be facilitated via the process of knowledge management. This issue is investigated by testing the first research hypothesis. Ladib (2015) founded out that social capital has a mediating role in the effect of the entrepreneurial orientation and knowledge management. In addition, entrepreneurial orientation and knowledge management have direct effect on innovation. In addition, Abdi & Senin (2014) obtained the results that organizational learning has a mediating role in knowledge management and organizational innovation.

H1: Knowledge management has effects on organizational innovation of the staff of the Sepahan Battery Industrial Complex.

Knowledge management seems necessary for successful production of new products and innovation in companies. Innovation is capable of converting tacit into explicit knowledge. The first task of innovative companies is to recombine the available knowledge and resources and explore new knowledge (Nonaka& Takeuchi, 1995). However, based on the conducted studies, the two variables of knowledge management and innovation have a mutual relationship. In other words, as innovation has effects on knowledge management, knowledge

management has effects on organizational innovation. Teresa et al. (2006) believe that innovation processes and knowledge management are the chain fields which can only result in the creation of ideas, innovation, and improvement in performances that they systematically support each other. Some researchers such as Li et al.(2008, p.403), Liao and Ta-Chien (2007, p.405), Johannessen (2008, p. 405), and Popadiuk and Choo (2007, p.309) investigated the effect of dimensions of knowledge management and organizational innovation on creation of ideas, innovation, and organizational performance. Other studies have focused on the direct relationship between the ability of knowledge management and innovation (Li and Calantone, 1998; Moller, 2007; Miller et al., 2007;Cantner et al, 2011) the ability of knowledge management and entrepreneurial orientation (Burton, 1999), entrepreneurial orientation and innovation (Li et al.,2008; Zhoo2005).Gunsel, Siachou & Acar (2011) believe that knowledge management provides grounds for organizational learning and finally results in increasing innovation in organizations. Vadadi and Abdolalian (2011), Yousefi et al. (2012), and Kor & Maden (2013), investigated the relationship of knowledge management and innovation and concluded that there is a direct correlation between knowledge management and innovation.

H2: Knowledge management has effects on organizational entrepreneurship of the staff working in Sepahan Battery Industrial Complex.

Knowledge management contributes in appropriately planning, guiding, and decision making via information and knowledge. The created knowledge can be applied in appropriate decisions by which it can result in competitive achievement and finally increases the degree of entrepreneurship significantly (Dindarlou, 2011). Entrepreneurship orientation results in designing processes, activities, and products significantly in organization via knowledge management (Ladib, 2015).

The results of a study conducted in small firms indicated that entrepreneurship is influenced by the increase in the effects of learning and accumulation of knowledge and consequently the increase in the development of companies (Pett& Wolff, 2007). Madhoushi and Sadati (2011) investigated the influence of knowledge management on organizational entrepreneurship in small and medium-sized firms and concluded that sharing and applying knowledge directly influences the organizational entrepreneurship and indirectly influences organizational entrepreneurship. The results of Amirkhani et al. (2011), entitled as “investigation of the effect of knowledge management on organizational entrepreneurship in the Ministry of Industry of Iran” indicates that knowledge management provides a ground for creating organizational entrepreneurship and can be effective on creating organizational entrepreneurship.

H3: Organizational innovation has effect on organizational entrepreneurship of Sepahan Battery Industrial Complex.

According to Zahra and Kevin (1995), experiential research available in this hypothesis confirms the issue that organizational entrepreneurship and innovation are closely related to each other and the result of this relationship is the improvement in organizational performance. Drucker (1985) introduced innovation as a particular instrument for

entrepreneurship. Therefore, among entrepreneurial companies, the most important factor is success. Regarding the vital role of innovation in entrepreneurship and working success in knowledge-oriented and ultra-competitive environments, the need to innovation has been increased (Chen and Huang 2009). Innovation is a process by which entrepreneurs change opportunities into presentable ideas for markets. Using this instrument, they can accelerate changes. Entrepreneurs combine imaginative and creative ideas with the ability of logical and systematic processing. This composition is the key to success (Danaeifard et al. 2011). Different researchers investigated this issue. For example, Scheepers, Hough, and Bloom (2008) and Zare, Feyzi and Mahboobi (2010) stated that the entrepreneurial space and innovation have positive and significant correlation with each other. In addition, the results of a research, done by Nasution et al. (2011), and Hindle (2009), indicated that there is a positive and significant correlation between entrepreneurship and innovation. Kardos (2012), conducted a research on the relationship of entrepreneurship, innovation, and sustainable development in the EU countries, ranked small and medium-sized firms via SME and indicated that small and medium-sized firms, wherein innovation is high, are at high level in terms of sustainable development. Tantau et al. (2015), in their research, entitled as “corporate entrepreneurship and innovation in the renewable energy field”, concluded that entrepreneurship characteristics and working independence have an important role in organizational innovation.

4. Research Method

A descriptive-correlational method was employed in this study. The population includes all staff of Sepahan Battery Industrial Complex as 800 individuals. The simple random sampling method was used for selection of 260 participants by Krejcie and Morgan’s table (1970) with 5% error. To collect the required data, a standard questionnaire was used for investigating organizational innovation based on the model developed by Jiménez et al. (2008). For investigating organizational entrepreneurship, the model of Antonic & Hisrich (2003) was used, and for measuring knowledge management, the questionnaire developed by Rahimi et al. (2011) was employed. Organizational innovation contains 17 questions in 3 dimensions (Productive Innovation, Process Innovation and administrative Innovation) based on 5-Likert scale (1= very strongly disagree to 5= very strongly agree).

The organizational entrepreneurship Scale of the questionnaire includes 4 dimensions (Self-renewal, Risk taking, Proactiveness and Competitive aggressiveness) and 16 questions based on 5-Likert scale (1= very low to 5= very high) and knowledge management Scale of the questionnaire includes 26 questions in 4 dimensions (Socialization, Externalization, Combination and Internalization). It is also based on 5-Likert scale (1= very strongly disagree to 5= very strongly agree). Content and face validity for the questionnaires were established by ten experts in science of management. To test the reliability, the questionnaire was pilot tested with a group of 30 from the respondents. The reliability of the organizational innovation was 0.75. Organizational entrepreneurship had a Cronbach’s alpha value of 0.71 and for knowledge management was calculated at 0.70. From among 260 distributed questionnaires, a number of 246 ones were returned by 39% female and 61% male participants. In addition, 8% of them held associate diploma, 42% of them held BA/BSc, and

50% of them held degrees higher than BA/BSc. Furthermore, 38% of the participants were under 30 years old, 42% of them were 30-40 years old, and 20% of them were 41-50 years old. To analyze data, the SPSS 18 and Smart-PLS were used that is explained as follows:

5. Data Analysis

To analyze data and investigate the fitness of good of the model, the PLS (Partial Least Squares) software program and with approach Partial Least Squares (PLS-SEM) was used. This software administers two tests:

5.1. The External Model Test (Measurement Model)

The external model test includes both reliability and validity of constructs and instruments.

5.1.1. Construct Reliability

The condition for establishing construct reliability is that the values of CR must be bigger than 0.7 and the values of the AVE must be bigger than 0.5 (Fornell and Larker, 1981). However, Wong (2013) considers the value 0.4 or bigger as sufficient for the AVE. the results obtained from table 2 indicate the acceptability of construct reliability.

5.1.2. Construct Validity

The condition for establishing convergent validity is that the values of CR for each construct should be bigger than the AVE (CR>AVE).

Table 2: Three criteria of Cronbach's alpha, CR, and convergent validity

Variables	AVE	Cronbach's alpha	CR
KM	0.74	0.65	0.85
OI	0.88	0.87	0.94
OE	0.81	0.77	0.90

Divergent validity: to investigate divergent validity, the method developed by Fornell and Larker (1998) was used. They state that divergent validity is at an acceptable level when the value of the AVE for each construct is bigger than the variance shared between that construct and other constructs (i.e. the square of the correlation coefficient between constructs) in the model.

Table 3: The matrix of measuring convergent validity using Fornell and Larker’s method

Variables	OI	KM	OE
OI	0.86		
KM	0.47	0.94	
OE	0.83	0.42	0.90

Table 3 indicated this matrix. Figures are values of this coefficient from zero to one of the variable. The model has acceptable validity when its values are bigger than 0.5 (Davari and Rezazadeh, 2013, p. 81).

5.2. The GOF of the Structural Model

In figure 2, the figure inside the two circles for endogenous variables indicate R^2 and values above arrows indicate the path coefficient or beta values. In addition, values above arrows towards observing variables indicate their factor loading. It should be noted that R^2 is only calculated for endogenous (dependent) variables and in case of exogenous (independent) constructs which is knowledge management in this mode; the value of this criterion is zero. The standardized path coefficient between knowledge management and organizational entrepreneurship as 0.13 indicates that knowledge management predicts 13% of the variations related to entrepreneurship directly. In addition, the two coefficients as 0.77 and 0.85 indicate that the variable of knowledge management indirectly and via the mediating variable of organizational innovation as 0.66 (0.85 multiplied by 0.77) is effective on organizational entrepreneurship.

According to the data analysis algorithm in the PLS method, after investigating the fitness of good of measurement models, the fitness of good of structural models should be investigated. This investigation includes z-significance coefficient, calculation of R^2 , Q^2 , and the total GOF of by the GOF.

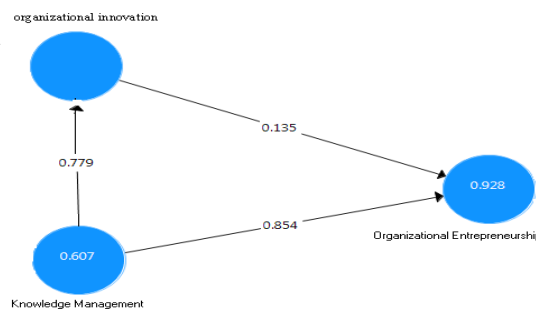


Figure 2: The model along with values of standardized path coefficients

Z-significance coefficient (t-values): to investigate the GOF of the structural model of the research, several criteria are used. The first and main criterion is z- significance coefficients. The GOF of the structural model using these coefficients is in such a way that they should be bigger than 1.96 in order that their significance can be confirmed at the confidence level as 95%.

Calculation of R^2 : this criterion indicates the effect of an exogenous variable on an endogenous one. In the table 4, R^2 which is positive indicates the sufficiency of the appropriate predictor of the model. The R^2 indicates this issue that how much of the dependent variable can be explained by the independent variable. The value of this coefficient ranges from zero to one and bigger values are more favorable. Chin (1988) evaluated values close to 0.67 as favorable, close to 0.33 as normal, and close to 0.19 as weak.

Calculating Q^2 : this criterion identifies the power of prediction and in case that the mean Q-value of an endogenous construct is bigger than 0.20, it indicates the sufficiency of the favorable predictor of the model.

Table 4: The results of R^2 and Q^2

Variables	R2	Q2
OI	0.607	0.245
OE	0.928	0.398

The overall fitness of good of the model: as stated, the PLS model, unlike models based on covariance, are lacking in diverse GOF indices. The GOF index in PLS can act as overall GOF indices and can be used for investigating the validity or quality of the PLS model in general. This index ranges from zero to one and values close to one indicate favorable quality of the model (Vinzi et al. Cited by Wong 2013). In addition, the calculated GOF value for the research model is equal 0.43 which indicates favorable GOF of the model. Therefore Main hypothesis was confirmed.

5.3. Testing H1, H2, and H3: Investigating Z Significance Coefficient (T-Values)

Figure 3 shows that after investigating the GOF of measurement model, structural model, and overall model, research hypotheses can be investigated and tested. As figure 2 indicates, z significance coefficient of the three paths among, organizational innovation, knowledge management and organizational entrepreneurship as 34.58, 24.270 3.66, and 24.270 respectively are bigger than 1.96. This issue indicates the significance of the direct effect of innovation on organizational entrepreneurship and the indirect effect of knowledge management on entrepreneurship via the mediating variable of innovation at the confidence level 0.95.

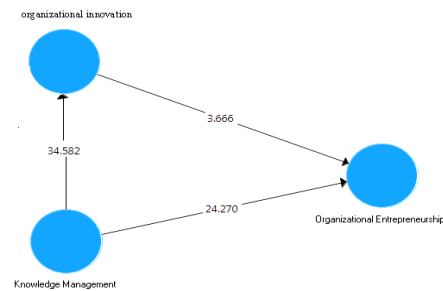


Figure 3: The research model with t-values

If path coefficients are bigger than 0.6, it means that there is a strong relationship between the two variables; therefore, if coefficients are between 0.3 and 0.6, there is a moderate relationship, and if they are smaller than 0.3, the relationship between variables is weak (Chin, 1998).

Table 5: Investigating Research Hypotheses

Hypotheses	Path Coefficient	t	Result	Amount of Impact
H1(KM-OI)	0.77	34.85	significant	Strong
H2(OI-OE)	0.13	3.66	significant	Moderate
H3(KM-OE)	0.85	24.27	significant	Strong

According to table 5, it can be illustrated that the results obtained from

testing the first hypothesis with path coefficient as 0.77 and t-value as 34.58, these results can be obtained that organizational innovation has a strong and significant effect on knowledge management. In testing the second hypothesis in terms of path coefficient as 0.13 and t-value as 3.66 indicate that organizational innovation has a moderate and significant effect on entrepreneurship. The results obtained from testing the third hypothesis with path coefficient as 0.85 and t-value 24.27 indicated that knowledge management has a strong and significant effect on entrepreneurship.

6. Discussion and Conclusion

The present study has been conducted on Sepahan Battery Industrial Complex, according to figure 2 and 3, one main hypothesis and three secondary hypotheses were confirmed. As indicated in figure 2, there is a correlation between organizational innovation and organizational entrepreneurship with the mediating role of organizational innovation of the

staff of the company. In addition, knowledge management has effects on innovation (table 5), knowledge management has effects on organizational entrepreneurship, and innovation has effects on organizational entrepreneurship (table 5). Generally, The GOF of the structural model using these coefficients was bigger than 1.96 at the confidence level as 95%. Also, the calculated GOF value for the research structural model is equal to 0.43, which indicates favorable GOF of the model. These findings are consistent with researches done by Amirkhani et al. (2011), Ladib (2015), Pett & Wolff (2007), Scheepers, Hough, & Bloom (2009), and Ndubisi & Iftikhar (2012). Paying attention to human resources of the complex which are sources of basic upheavals can result in increasing innovations and entrepreneurship in the process of production and presenting services. According to the results of the present study, one of the important instruments for developing human forces in this company is the application and implementation of knowledge management. Ladib (2015) argues that "increasing the ability to exploit and explore new knowledge, encouraging members to be proactive, to look for new opportunities to take the risk in uncertain situations and to implement various measures Innovative allow one hand to increase the ability to exploit and explore knowledge and secondly to increase the innovation capacity of new products or services which will thus act positively on the share of market sales and the ability to anticipate market changes"(p:23). In addition, Tantau et al. (2015) believe that one of the characteristics of entrepreneurship organizations is their innovativeness. In fact, intra-organizational innovation results in the encouragement of individuals to do entrepreneurship and increases the staff's satisfaction in the organization. The mentioned organization facilitates the conversion of innovation into entrepreneurship via implementing knowledge management. In other words, using elements of knowledge management with innovative orientation would result in reinforcing characteristics such as creativity, risk-taking, and identification of business opportunities in the staff. In addition, it helps the organization to move towards entrepreneurship via the reception of trainings related to entrepreneurship.

7. Recommendation

In any case, organizational innovation (Naranjo-Valencia, 2015) and entrepreneurship (Lisetchi and Brancu, 2014) also Knowledge management (Skyrme and Amidon, 1998) are becoming a core competence that companies must develop in order to succeed in tomorrow's dynamic economy.

Our study makes some important contributions. First, we proposed and tested a conceptual model that connects knowledge management and organizational entrepreneurship with organizational innovation. Second, our study is unique in explaining the relationship between knowledge management and entrepreneurship via organizational innovation. Knowledge management is a facilitator factor for this relationship which has not been investigated in prior studies. This study highlights how knowledge management affects organizational innovation and entrepreneurship.

Considering the results, it is recommended that authorities of Sepahan Battery Complex establish an innovation working group for increasing the level of innovation. This working

group should support entrepreneurial cultural and trains the personnel for producing diverse and innovative ideas. In addition, the establishment of R&D unit in the organization under the supervision of the Innovation Working Group is necessary. The main task of this unit can be content production (presenting required documentations) for the Innovation Working Group.

Furthermore, it is recommended that necessary measures regarding the process of knowledge sharing, information collection and the record of important events in the organization (documentation of past failures and successes of the organization about the staff's entrepreneurship). Therefore, Industrial organizations should pay their utmost attention to the fact that KM and its index are able to cover a wider range of motivational factors to employees and managers working in the Industrial sector. Despite this study's theoretical and practical contributions, we acknowledge that our research design has some limitations and raises questions for future researches and other researchers. First, we measured conceptual model from Jiménez et al. (2008), Nonaka & Takeuchi (1995) and Antonic & Hisrich (2003). Further studies should include other patterns. Second, in this research, data for the independent and the dependent variables came from a single source. Further studies should preferably include measures of independent and dependent variables collected from different sources.

References

- Abdi, K. & Senin, A. A. (2015). The Impact of Knowledge Management on Organizational Innovation: An Empirical Study. *Asian Social Science*; 11(23).
- Alvani, S. M. Kohannejad, R., Safari, S. & Khodamoradi, S. (2013). Identifying and prioritizing factors affecting the implementation of the understanding the role of entrepreneurship through the institutionalization of entrepreneurship, *Journal of Management Studies (Improvement and Transformation)*. 22 (70): 1-24. (In Persian).
- Amirkhani, T., Aghaz, A. & Abdollahpour, M. (2011). Investigating Impact KM on Organizational entrepreneurship, *Scientific-Research Journal of Shahed University Management and Achievement*. 47 (1): 295-308. (In Persian).
- Antonic, B & Hisrich, R.D. (2003). Clarifying the entrepreneurship concept, *Journal of Small Business and Enterprise Development*, 10 (1): 7-24.
- Burton, J. (1999). Innovation, Entrepreneurship and the Firm: a Post-Schumpeterian Approach, *International Journal of Technology Management*, 17(1/2): 16-36.
- Cantner, U., Joel, K. & Schmidt, T. (2011). The Effects of Knowledge Management on Innovative Success - An Empirical Analysis of German Firms, *Research Policy*, 40(10): 1453-1462.
- Chen, C. J. and Huang, J. W. (2009). Strategic human resource practices and innovation performance: the mediating role of knowledge management capacity, *Journal of Business Research*, 62(1): 104-114.

- Chin, W. (1988). Issues and Opinion on Structural Equation Modeling .*MIS Quarterly*, (1)22, vii-xvi.
- Cristea, D.S. &Capatina, A. (2009). Perspectives on knowledge management models, *Economics and Applied Informatics*,2(2):355-366.
- Danaeifard, H, Mohammadi,F, and saeedikiya,M. (2011). The relationship of innovation and entrepreneurship.The 1st International Conference of Management and Innovation. Shiraz (2011).http://www.civilica.com/PaperMIEAC01_806.html.(in Persian).
- Davari,A, &Rezazadeh, A. (2013). *Modeling structural equations*. Tehran: Jahad Daneshgahi, Tehran Branch.
- Dindarlou, N. (2011). The relationship between knowledge management and organizational intelligence of faculty members in Islamic Azad University of Shiraz. *Unpublished MA thesis*, University of Marvdasht Islamic Azad.(in Persian)
- Druker, P. (1985). The Discipline of Innovation, *Harvard Business Review*, 63(3):67-72.
- Fornell, C., Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error.*Journal of Marketing Research*, 18 (1), 39-50.
- Gunday, G.Ulusoy, G,Kilic, K. &Alpkan, L.(2011).Effects of innovation types on firm performance.*International Journal of Production Economics*.133(2):662-676.
- Gunsel, A., Siachoub, E. &Acar, A.Z. (2011). Knowledge Management and Learning Capability to Enhance Organizational Innovativeness, Knowledge 5th International Conference, *Procedia Social and Behavioral Sciences* 24: 880–888
- Hamza, S. E. A. (2008). Competitive Advantage via A Culture of Knowledge Management: Transferring Tacit Knowledge Into Explicit.*Journal of Knowledge Management Practice*.9(2). Available:<http://www.tlinc.com/articl152.htm>.
- Hamel G. (2006). The why, what, and how of management innovation.*Harvard Business Review*, 72: 72-84. <https://hbr.org/2006/02/the-why-what-and-how-of-management-innovation>.
- Haney, D.S. (2003).KnowledgeManagement in a Professional Service Firm, Doctoral Dissertation.Indiana University<http://202.28.199.34/multim/3122695.pdf>.
- Hindle, K.(2009). The relationship between innovation and entrepreneurship: easy definition, hard policy.
<http://kevinhindle.com/publications/J4.2009-AGSE-Hindle-Inn-Ent-Pol.pdf>
- Hitt, M.A,Duane Ireland R, Camp S.M. & Sexton, D. (2002). *Strategic Entrepreneurship: Creating a new mindset*. 1st Ed. Oxford: Wiley- Blackwell.
- Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: a review of four recent studies. *Strategicmanagement journal*, 20(2), 195-204.

Jimenez,j, Sanz,D, Raquel,V. &, Miguel, H.E. (2008). Fostering Innovation: The role of market orientation and organizational learning.*European Journal of Innovation Management*, 11(3): 389-412.

Johannessen, J.A. (2008). Organizational innovation as part of knowledge management, *International Journal of Information Management*, 28(5):403–412.

Kalmuk,G&Acar,A,Z. (2015). The Mediating Role of Organizational Learning Capability on the Relationship between Innovation and Firm's Performance, *Procedia- Social and Behavioral Sciences*, 210(2): 164 – 169.

Kardos, M. (2012). Research on European Union Countries, International Conference Emerging Markets Queries in Finance and Business(2012),*Procedia Economics and Finance* ,3: 1030 – 1035.

Katila, R., & Shane, S. (2005). When Does Lack of Resources Make New Firms Innovative?*Academy of Management Journal*, 48(5): 814-829.

Kirzner, I. (1973). *Competition and Entrepreneurship*. Chicago: University of Chicago Press.

Kor,B, Maden,C,(2013). The relationship between knowledge management and innovation in Turkish service and high-tech firms.*International Journal of Business and Social Science*.4 (4):239-304.

http://ijbssnet.com/journals/Vol_4_No_4_April_2013/30.pdf.

Kroeger, J. W. (2007). Firm Performance as a Function of Entrepreneurial Orientation and Strategic Planning Processes, Electronic Theses and Dissertation, Available:https://etd.ohiolink.edu/ap/10?0::NO:10:P10_ACCESSION_NUM:csu1199827811

Ladib, N, B, R.((2015).Effects of Capacity Knowledge Management and Entrepreneurial Orientation on Organizational Effectiveness in the Best Tunisian Companies: Mediating Role of Social Capital, *Journal of Knowledge Management, Economics and Information Technology*,7(1):3-34,http://www.scientificpapers.org/wp-content/files/1493_Nadia_LadibEffects_of_Capacity_Knowledge_Management_and_Entrepreneurial.pdf

Li .T. &Calantone, RJ. (1998). The Impact of Market Knowledge Competence on New Product Advantage: Empirical Examination and Modellization, *Journal of Marketing*, 62(4): 13-29.

-Li, Y., Guo, H., Liu, Y. & Li, M. (2008).Incentive Mechanisms, Entrepreneurial Orientation and Technology Commercialization: Evidence from China's Transitional Economy, *Journal of Product Innovation Management*, 25(1):63-78.

Liao, H. S. & Ta-Chien H.T. (2007).Knowledge transfer and competitive advantage on environmental uncertainty: An empirical study of the Taiwan semiconductor industry, *Technovation*, 27(6-7):402,411.

Lisetchi, M. &Branclu,L.(2014). The entrepreneurship concept as a subject of social

innovation. *Procedia - Social and Behavioral Sciences* 124: 87 – 92

Madhoushi, M. & Sadati, A. (2011). Investigating the impact of the process of managing knowledge on entrepreneurship (small and medium-sized businesses in East Mazandaran case study). *Entrepreneurship Development*, Third Year, 12:7-26. (in Persian).

Madhoushi, M., Sadati, A., Delavari, H., Mehdivand, M. & Hedayatifard, M. (2010). Facilitating knowledge management strategies through IT and HRM, *Chinese business review*, 9(10): 57-71.

Miller, D., J, Fern, M.J. & Cardinal, L., B. (2007). The Use of Knowledge for Technological Innovation within Diversified Firms, *Academy of Management Journal*, 50(2):308-326.

Moller, C. (2007). Process Innovation Laboratory: A New Approach to Business Process Innovation Based on Enterprise Information Systems, *Enterprise Information Systems*, 1(1):113-128.

Nasution, H.N., Mavondo, F.T., Matanda, M.J. & Ndubisi, N.O. (2011), Entrepreneurship: Its relationship with market orientation and learning orientation and as antecedents to innovation and customer value, *Industrial Marketing Management*, 40(3): 336-345.

Naranjo-Valencia, J., C. Jiménez-Jiménez, D. & Sanz-Valle, R. (2015). ARTICLE Studying the links between organizational culture, innovation, and performance in Spanish companies, *Revista Latinoamericana de Psicología*,

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

Ndubisi, N., O. & Iftikhar, K. (2012). Relationship between entrepreneurship, innovation and performance: comparing small and medium-size enterprises, *Journal of Research in Marketing and Entrepreneurship*, 14(2): 214–236, 2012.

Nonaka, I. & Takeuchi, H. (1995). *The knowledge creating company: how Japanese companies create the dynamics of innovation*, Oxford: Oxford University Press.

OECD, (2010). SMEs, Entrepreneurship and Innovation, Series: OECD Studies on SMEs and Entrepreneurship.

(<http://www.oecd.org/cfe/smesentrepreneurshipandinnovation.htm>).

Pett, T.L. & Wolff, J.A. (2007). SME performance: A case for internal consistency. *Journal of Small Business Strategy*, 18(1): 1-16.

Popadiuk, S., & Choo, C.W. (2007). Innovation and knowledge creation: How are these concepts related, *International Journal of Information Management*, 26(4): 302-312.

Rahimi, H., Arbabisarjou, A., Allameh, S., M. & Aghababaei, R. (2011). Relationship between Knowledge Management Process and Creativity among Faculty Members in the University. *Interdisciplinary Journal of Information, Knowledge, and Management*, 6:18-33.

Sathe, V. (2006). From surface to deep corporate entrepreneurship. *Human Resource Management*, 27(4):389-411.

- Scheepers, M.J., Hough J. & Bloom, J.Z. (2008). Nurturing the corporate entrepreneurship capability. *Southern African Business Review*, 12(3):50-75.
- Schumpeter, J. (1934). *The Theory of Economic Development*. Harvard University Press, Cambridge.
- Skyrme, D.J. & Amidon, D.M. (1998). New measures of success, *Journal of Business Strategy*, 19 (1): 20-4.
- Subramaniam, M. & Youndt, M. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48(3): 450-463.
- Tantau, A., Chinie, A. & Carlea, F. (2015). Corporate Entrepreneurship and Innovation in the Renewable Energy Field. *Procedia Economics and Finance*, 22 (2015) 353 – 362.
- Teresa L.J, Chia-Ying, L, & Tein-Shiang L. (2006). A contingency model for knowledge management capability and innovation, *Journal of Industrial Management & Data System*, 106(6): 855-877.
- Vadadi, A. & Abdolalian, H. (2011). Investigation of the relationship between knowledge management and organizational innovation in Human Resources National Iranian Oil Products Distribution, *Human Resources Management Quarterly Scientific Research on Oil Industry*, 4 (13): 158-141. (In Persian)
- Wickham, P. A. (2006). *Strategic entrepreneurship*. Essex, UK: Prentice Hall.
- Wickramasinghe, N., Von Lubitz, Dag K. J. E. (2007). *Knowledge-based Enterprise: Theories and Fundamentals*, Hershey, PA: IGI Global.
- Wolff, J.A. & Pett, T.L. (2007). SME performance: The case for internal consistency. *Journal of Small Business Strategy*, 18(1):1-16. <http://libjournals.mtsu.edu/index.php/jsbs/article/viewFile/84/73>
- Wong, K., K. K. (2013). Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using Smart PLS, *Marketing Bulletin*, 24:1-32.
- Yeazdanshenas, M. (2014). Designing a Conceptual Framework for Organizational Entrepreneurship in the Public Sector in Iran, *Iranian Journal of Management Studies (IJMS)*, 7(2):175-191.
- Yilmaz, E. (2013). Examination of Entrepreneurship from Humanistic Values Perspective, *Sociology Mind*. 3(3):205-209.
- Yousefi, E. Feyzi, J., S. & Soleymani, M. (2012). Evaluating the impact of knowledge management on innovation among the managers and employees of technology companies based in Orumia University of Science and Technology Park, *Initiative and Creativity in the Humanities*, 1 (3): 29-51.
- Zahra, S. K. & Covin, J., G. (1995), Contextual Influences on the Corporate Entrepreneurship-Performance Relationship Company in Established Firms: A Longitudinal

Analysis, *Journal of Business Venturing*, and 10(1):43-58.

Zaied, R.M.B, Louti, H. &Affes, H. (2015).The relationship between organizational innovations, internal sources of knowledge and organizational performance.*International Journal of Managing Value and Supply Chains (IJMVSC,)* 6(1):53-67.

Zare, H., Feyzi, A. &Mahboobi T. (2010).Investigation of the relationship between organizational atmosphere withjob stress and creativity of the employees at department of education and training of Western Azerbaijan.*Researches of behavioral sciences*, 16:114-124.

Zhao, F. (2005).Exploring the synergy between entrepreneurship and innovation, *International Journal of Entrepreneurial Behavior & Research*, 11(1):25 - 41.

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