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## Entrepreneurial Orientation and Innovation Performance: The Mediating Role of Knowledge Management

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**Abstract:** Firms with greater innovativeness will be more successful in responding to changing environments and in developing new capabilities that allow them to achieve better performance. Former researchers have emphasized that Entrepreneurial Orientation (EO) is a key ingredient for firm innovation. This study tried to accentuate the role of Knowledge Management (KM) in the relations of Entrepreneurial Orientation (EO) and innovation performance. The population in the study was 164 Iranian SMEs. This study developed and simultaneously tested three hypotheses about: (1) The impact of EO on innovation performance, (2) The impact of EO on KM, and (3) The impact of km on innovation performance. LISREL software was used to test the hypotheses. The results indicated that entrepreneurial orientation both directly ( $B = 0.38$ ) and indirectly through the knowledge management ( $B = 0.377$ ) affected innovation performance. Hence, knowledge management acts as a mediator between entrepreneurial orientation and innovation performance.

**Key words:** Entrepreneurial orientation, innovation performance, knowledge management

### INTRODUCTION

Innovative or die. Since the beginning of the recent decade when the competitive environment went through a major transformation due to globalization, business organizations have intensified their search for strategies that will give them a sustainable competitive advantage. Such strategies generally require that the firm continuously differentiates its products and process, that is, firms must constantly be innovative (Popadiuk and Choo, 2007). In such condition, where innovation in products and process regarded as an essential prerequisite for the organizational survival and success, attention to entrepreneurship orientation and change to an entrepreneur organization attracted the much attention of academic researchers and organizational members (Wang and Ahmed, 2004). Ireland and Webb (2007) confirmed that Entrepreneurial orientation is manifest in product and process innovations. Lumpkin and Dess (1996), described EO as the process, practice, and decision-making activity that leads to new entry. They delineated five dimensions of EO including innovativeness, risk taking, proactiveness, competitive aggressiveness and autonomy, which underlie nearly all entrepreneurial processes. Innovativeness is an organization's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products,

services or technological processes, as well as the pursuit of creative, unusual, or new solutions to problems and needs (Lumpkin and Dess, 1996; Lumpkin and Dess, 2001b; Certo *et al.*, 2009). Risk taking refers to a firm's tendency to engage in high-risk projects and managerial preferences for bold versus cautious actions in order to achieve firm objectives (Miller, 1983). Proactiveness is the process of anticipating and acting on future needs by seeking new opportunities which may or may not be related to the present line of operations, introduction of new products and brands ahead of competition, strategically eliminating operations which are in the mature or declining stages of the life cycle (Lumpkin and Dess, 2001). Competitive aggressiveness has been defined as a firm's tendency to intensely and directly challenge its competitors in order to outperform rivals in the marketplace (Certo *et al.*, 2009). Autonomy in an entrepreneurial sense is the independent action by a team or individual to bring forth a vision or idea and then see it through to completion (Lumpkin and Dess, 1996). Prior research supports this view as autonomy has been found to encourage innovation, increase the competitiveness and effectiveness of a firm, and promote the launching of new ventures (Brock, 2003).

According to above discussion, Entrepreneurial orientation can be considered as the processes, practices, philosophy, and decision-making activities that lead

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organizations to innovation (Lumpkin and Dess, 2001b; Wiklund and Shepherd, 2005; Li *et al.*, 2009). The importance of entrepreneurial orientation to the survival and performance of firms has been acknowledged in the entrepreneurship literature (Lumpkin and Dess, 2001b; Wiklund and Shepherd, 2005; Covin and Slevin, 1991; Smart and Conant, 1994; Tat *et al.*, 2007; Hughes, Morgan, 2007). Innovation is a crucial factor in firm performance because of the evolution of the competitive environment (Bueno and Ordoñez, 2004). Innovation performance is considered to have a direct effect on firm performance (West and Iansiti, 2003; Brockman and Morgan, 2003). Also, Ireland and Webb (2007) argue that entrepreneurial actions have direct effects on product and process innovation. So, as EO increases a firm's autonomy, competitive aggressiveness, proactiveness and willingness to take risks and innovate (Zahra *et al.*, 1999; Lumpkin and Dess, 2001b), EO and innovation performance can be linked with each other. Although, former literatures has traditionally conceived innovation as an indicator of entrepreneurship and EO [12, 8], However; a few researches have empirically analyzed this relationship. Hence, we hypothesize:

**Hypothesis 1: Entrepreneurial orientation positively affects innovation performance:** Most previous studies investigating the independent effect of entrepreneurial orientation on firm's innovation performance and ignore the factors that may mediate the strength of the entrepreneurial orientation and firm's innovation performance. Wiklund and Shepherd (2003) believe Entrepreneurial attitudes and behaviors are critical for new ventures to facilitate the utilization of new and existing knowledge to discover market opportunities. On the other hand, Firms with innovativeness have a tendency to support new ideas and novelty, and further increase the engagement in developing new products or processes (Lumpkin and Dess, 1996; Li *et al.*, 2009). The development of new products and process involves extensive and intensive knowledge activities. Firms with entrepreneurial orientation tend to depend on employees' knowledge and skills as key inputs in the knowledge process (Lumpkin and Dess, 1996). So, on account of the significant role of knowledge in discovering of opportunities and new ideas it needs to be managed. According to this, firms with entrepreneurial orientation are more prone to focus attention and effort towards knowledge management. So we can reasonably expect the positive relationship between entrepreneurial orientation and knowledge management. Hence, we hypothesize:

**Hypothesis 2: Entrepreneurial orientation positively affects knowledge management:** Nonaka (1991) believes in the present competitive climate where the only

certainty is uncertainty, knowledge considered the main distinguishing factor of business success and seen as the foundation of innovation. Knowledge management is an approach of more leveraging the knowledge and expertise to create value and enhance organizational effectiveness (Zheng *et al.*, 2009). Lin (2005) defined KM as a planned, structured process to manage the acquisition, Sharing and applying knowledge as an organizational asset to encourage innovation performance. Knowledge acquisition is defined as the processes that use existing knowledge and capture new knowledge. Knowledge sharing is defined as the processes that distribute knowledge among all individuals participating in process activities. Knowledge application is defined as the business processes through which effective storage and retrieval mechanisms enable a firm to access knowledge easily (Lin, 2005). Previous researches confirm that effective knowledge management facilitates knowledge communication and exchange required in the innovation process, and further enhances innovation performance through the development of new insights and capabilities (Nonaka and Takeuchi, 1995; Argote *et al.*, 2003). Therefore, knowledge management can play a pivotal role in supporting and fostering innovation (Chen and Huang, 2009). Accordingly, this study proposes that knowledge management in terms of acquisition, sharing, and application provides a positive contribution to the firm's innovation performance. So, by the effective knowledge management, firms will be able to transform knowledge into innovative product and process. Hence, we hypothesize.

**Hypothesis 3: Knowledge management positively affects innovation performance:** Also, it should be pointed out that the previous relevant researches have been conducted mainly in developed countries, leaving the generalization of their findings as an open issue for other research settings, such as transitional economies like Iran. Iran is now changing from centrally planned to market based economies. Such rapid changes and high levels of uncertainty raise a great challenge for Iranian SMEs to enhance innovation. Given the limited research in this area, promoting innovation through knowledge management in such turbulent environments remains largely unknown. We think that Iranian SMEs will provide us with a fascinating opportunity to examine the effect of entrepreneurial orientation and knowledge management on innovation.

Based on the above discussion, this study attempts to examine the relationships among knowledge management, Entrepreneurial orientation and innovation performance in Iranian SMEs. The conceptual model showed in Fig. 1. The contention of this model is that knowledge management mediates the effect of EO on innovation performance in Iranian SMEs.

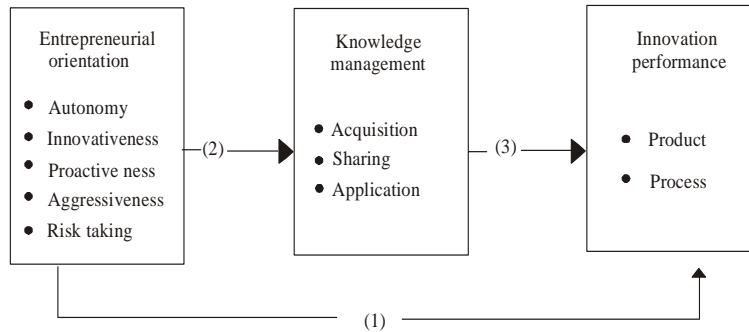


Fig. 1: Conceptual model

Table 1: Characteristics of the sample (N=164)

Characteristics	Classifications	Frequency	Percentage	Cumulative percentage
Industry	Manufacture industry	129	78.7	78.7
	Service industry	35	21.3	100
Firm age	Less than 3 years	22	13.4	13.4
	4-6 years	67	40.9	54.3
	7-10 years	75	45.7	100
Number of employees	Under 50	17	10.4	10.4
	50-200	115	70.1	80.5
	201-500	32	19.5	100

Table 2: Measurement items and reliabilities

Construct	Dimension	Item	Cronbach alpha
Entrepreneurial orientation	Innovativeness	3 item	0.858
	Risk-taking	2 item	0.808
	Proactiveness	3 item	0.884
	Competitive aggressiveness	2 item	0.783
	Autonomy	3 item	0.904
Knowledge management	Knowledge acquisition	3 item	0.875
	Knowledge sharing	3 item	0.839
	Knowledge application	2 item	0.775
Innovation performance	Product innovation	2 item	0.730
	Process innovation	2 item	0.769

\*: All items were measured with five-point Likert scale

## MATERIALS AND METHODS

**Sample and data collection:** The present study employs a questionnaire survey approach to collect data, and all independent and dependent variables require five-point Likert-style responses ranged from 1 = “strongly disagree”, through 3 = “neutral” to 5 = “strongly agree”. Variables in the questionnaire include background information, entrepreneurial orientation, innovation performance and knowledge management. The population was the SMEs that were located in the industrial zone of Mazandaran province in Iran in summer of 2010. We selected the firms founded in ten years. The authors distribute 365 questionnaires and request the questionnaires to be completed by top executives (i.e., Presidents, Vice-Presidents, Directors, or General Managers) who are familiar with the topic of this study. Of the 365 questionnaires distributed, 175 responses were received and 11 of them were incomplete. The remaining 164 valid and complete questionnaires were used for the

quantitative analysis. It represented a useable response rate of 44.9%. The key characteristics of the sample including the industry, firm age and number of employees are shown in Table 1.

### Measures:

**Entrepreneurial orientation:** We adopted Lumpkin and Dess (1996), definition of EO dimensions as follows. Innovativeness consists of three questions to measure firm's willingness to support creativity and experimentation in introducing new products/services, and novelty and R&D in developing new processes. Risk-taking consists of two questions to measure firm's tendency to venturing into unknown new markets, committing a large portion of resources to ventures with uncertain outcomes. Proactiveness consists of three questions to measure firm's relations to market opportunities by seizing initiative in the marketplace. Competitive aggressiveness consists of two questions to measure firm's reaction to competitive trends and

Table 3: The loadings ( $\lambda$ ) of the items and AVEs of the constructs

Construct	Items	$\lambda$	The square root of AVE
Entrepreneurial orientation	EO1 - Innovativeness	0.69	0.70
	EO2 - Risk-taking	0.67	
	EO3 - Proactiveness	0.79	
	EO4 - Competitive aggressiveness	0.65	
	EO5 - Autonomy	0.70	
Knowledge management	KM1 - Knowledge acquisition	0.42	0.67
	KM2 - Knowledge sharing	0.75	
	KM3 - Knowledge application	0.75	
Innovation performance	IP1 - Product innovation	0.54	0.52
	IP2 - Process innovation	0.51	

\*: AVE is average variance extracted

Table 4: Means, standard deviations and correlations of the constructs

Construct	Mean	S.D	1	2	3
Entrepreneurial orientation	3.167	0.603	1.000		
Knowledge management	2.721	0.563	0.387**	1.000	
Innovation performance	2.558	0.571	0.445**	0.496**	1.000

\*\* : Correlation is significant at the 0.01 level (2-tailed)

demands that already exist in the marketplace. Autonomy consists of three questions to measure independent action by an individual or team aimed at bringing forth a business concept or vision and carrying it through to completion.

**Innovation performance:** We adopted Wang and Ahmed (2004), definition of innovation dimensions as follows. The product innovation includes two questions to measure the extent of responsiveness to environmental changes in terms of goods and services. The process innovation consists of two questions to measure the extent to which the firm develops marketing processes and manufacturing processes to improve quality and lower costs.

**Knowledge management:** We adopted Chen and Huang (2009) and definition of KM dimensions as follows. The knowledge acquisition factor consists of three questions, with respondents indicating the extent to which they obtain knowledge from customers, partners, and employees. The knowledge sharing factor consists of three questions to reflect the degree to which the knowledge is openly shared between supervisors and subordinates, between colleagues, and between units. The two questions in knowledge application factor are the effective management and utilization of knowledge into practical use.

**Reliability and validity:** The internal consistency method was used to assess the reliability of empirical measurements. Internal consistency was estimated using Cronbach's  $\alpha$  value. The results of analysis shown in Table 2, all ten dimensions show Cronbach's  $\alpha$  above the recommended value of 0.70 (Yang *et al.*, 2005), which indicates a relatively high degree of internal consistency.

On the other hand, it is also important to verify whether the validity of the measurement in this study was acceptable. This study applied Fornell and Larcker

(1981), measure of Average Variance Extracted (AVE) to access the discriminate validity of the measurement. The AVE measures the amount of variance captured by the construct through its items relative to the amount of variance due to the measurement error. To satisfy the requirement of the discriminate validity, the square root of a construct's AVE must be greater than the correlations between the construct and other constructs in the model. For example, the square roots of the AVEs for the two constructs, entrepreneurial orientation and knowledge management, are 0.70 and 0.67 in Table 3, which are more than the correlation, 0.387, between them in Table 4. This demonstrates there is adequate discriminate validity between the two constructs. The square roots of all constructs' AVEs in Table 3 of this study were also greater than the correlations among all constructs in Table 4. Therefore, the discriminate validity of the measurement in this study was acceptable. In sum, it demonstrated that there were adequate reliability and validity in this study.

## RESULTS AND DISCUSSION

Table 4 shows the means, standard deviations and the correlation matrix of this study. In this table, there were significantly positive correlations among entrepreneurial orientation, knowledge management and innovation performance. To test the hypothesized relationships in our path-analytic framework, we employed LISREL.

The hypotheses were examined using LISREL 8.5. Paths between constructs represent individual hypotheses, and each was assessed for statistical significance of the path coefficient. This study tested hypothesized relationships with a full model, and the LISREL analysis of this model produced a chi-square of 47.31 (df = 32). In addition to this chi-square value (models had chi-squares less than three times their degrees of freedom, 47.31/32 = 1.48), the various goodness-of-fit indices also

Table 5: Structural model results

Hypotheses	Proposed effect	Path coefficient	T-value	Results
H1	+	0.38	2.82**	H1 is supported
H2	+	0.49	3.71**	H2 is supported
H3	+	0.77	3.66**	H3 is supported

\*\* : p<0.01

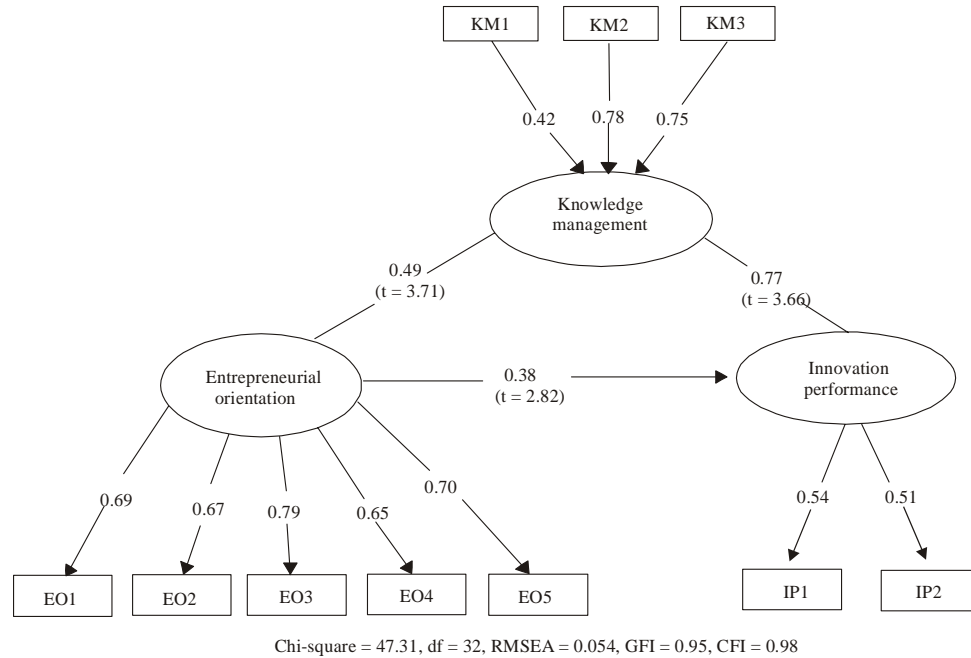


Fig. 2: The results of this study

suggested a very good fit (GFI = 0.95, AGFI = 0.91, NFI = 0.95, CFI = 0.98, RMSEA = 0.054). The analysis also provided support for the three study's hypotheses. The results were reported in Table 5 and Fig. 2 showing the path coefficients, t-values, and construct relationships

As hypothesized, there is a positive relationship between entrepreneurial orientation and innovation performance ( $\gamma_{11} = 0.38$ ,  $t = 2.82$ ). Therefore, H1 is supported. Results uphold the proposition that the two concepts are indeed related and, therefore, support the conclusions, which postulate that entrepreneurial orientation is important to enhance innovation performance. A positive relationship between entrepreneurial orientation and knowledge management is established ( $\gamma_{21} = 0.49$ ,  $t = 3.71$ ). Therefore, H2 is supported. As scholars have postulated, perhaps the firms in new ventures may be better served by adopting appropriate entrepreneurial orientation and knowledge management. As predicted, there is a significantly positive relationship between knowledge management and innovation performance ( $\beta_{12} = 0.77$ ,  $t = 3.66$ ). Therefore, H3 is supported. The results were reported in Table 5 and Fig. 2 showing the path coefficients, t-values, and construct relationships.

The Fig. 2 demonstrates that knowledge management mediates the relationship between entrepreneurial orientation and innovation performance (total effect = 0.757, indirect effect = 0.377, direct effect = 0.38). In this case, the indirect and direct effects are significant. Although the direct effect comprises only 50.20% of the total effect of the independent variable on the dependent variable, with the remaining 49.80% occurring through the mediating variable of knowledge management. Accordingly, these results support our argument, that entrepreneurial Orientation enables firms to effectively acquire, sharing and application knowledge, which affects innovation performance positively.

This study provides a conceptual model to examine the relationships among EO, knowledge management and innovation performance. The Results show that EO positively influences the firm's innovation performance; and knowledge management plays as a mediator to increase these positive relationships. Thus, we demonstrate that knowledge management is not only an independent managerial practice, but also a central mechanism that leverages EO influence on innovation performance. The findings of this study contribute to the theoretical development of a conceptual model for explaining the relationships among EO, knowledge

management, and innovation performance. This result responds to the suggestion of Hult (2003), who suggested that future research should be conducted to understand how the organization's climate facilitates the firm's knowledge management. While Wiklund and Shepherd (2003), posited that EO could enhance knowledge-based resources and firm performance. Our finding supports the argument that it further enriches it by going deep into the process of knowledge management. The findings of this study fill the gap in the literature that is lack of empirically examining the mediating roles of knowledge management in the relationships between EO and innovation performance.

As far as we know, nowadays; the business environment is complex, dynamic, and ever more competitive. In response to the significant changes in the market environment, many organizations have placed greater importance on innovation for new value creation for their customers. Hence, in the recent decade organizations make more attention to EO for innovation. This study attempts to imply that how EO lead to innovation. On the one hand, EO as an organizational behavior and culture can create proper climate by itself to directly reinforce and facilitate idea creation and product and process innovation. This finding confirms Lumpkin and Dess (2001), Hughes and Morgan (2007) and Ireland *et al.* (2005), researches that have concluded EO directly affect organizational innovation and performance. On the other hand, this paper concludes organizations that have EO, orientate to customers, employees and suppliers to identify their needs and wants and acquire their knowledge. Knowledge acquisition from the outside marketplace and the inside organization provides opportunities for firms to recombine current skill and knowledge and create new knowledge to innovation. As well as for more effectiveness, organizations usually tend to share their acquired knowledge between customers, employees and the others beneficiaries. Prior research has discussed and demonstrated that knowledge sharing implies the new combination of knowledge that has previously existed separately, which possibly would result in process improvements or novel products (Tsai and Ghoshal, 1998). Ultimately acquired or shared knowledge must be applied to be useful in facilitating innovation. Application of knowledge enables firms continuously to translate their knowledge and organizational expertise into embodied products. In addition to by effectively applying knowledge, organizations are able to speed new product development and create more innovative production processing technologies and administrative systems. Therefore, EO can results in product and process innovation through knowledge management. This is in line with Li *et al.* (2009) research that have suggested that knowledge creation process plays a mediating role between entrepreneurial orientation and organizational performance.

This study has implications for managers. Although managers recognize the importance of entrepreneurship and EO, their implications for and demands on the rest of the organization are often ignored in the process toward its success. This study calls on firm managers to be aware of the importance of knowledge acquiring, sharing and application. Under this context, our results suggest that by strengthening EO, the firms should make more efforts to enhance their capabilities of both knowledge absorption and knowledge application and then improve their innovation. Despite of its important contributions, our results must be viewed in the light of the study's limitations. First, the results of this study are context-specific. Although it is theoretically feasible to extend this study to other contexts, the specific differences between Iranian SMEs and other emerging economies restrict the generalizability of this study's findings. Therefore, the other useful extension would be to conduct this study in other emerging countries. Second, as with all cross-sectional research, the relationship tested in this study represents a snapshot in time. While it is likely that the conditions under which the data were collected will remain essentially the same, there are no guarantees that this will be the case. Furthermore, EO may have further implications on innovation performance in the long term, but as this is not a longitudinal study, we cannot evaluate its effects. Future longitudinal studies might assess EO outcomes in the long term in both KM and innovation performance.

## CONCLUSION

Based on theoretical background and conceptual model, this research examined the relationships among EO, knowledge management and innovation performance in Iranian SMEs that were located in industrial zone. In this study, we found that entrepreneurial orientation both directly and indirectly through the knowledge management influence on innovation performance. Hence, knowledge management plays a mediating role between entrepreneurial orientation and innovation performance. Although the results provide new insights to current research, this field is far from well developed, and a continued research effort is needed to understand organizational knowledge, knowledge management process, entrepreneurship process and their integrated influences on firms' innovation performance.

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