



## **Explaining the Mediating Role of Innovation in Relationship Between Knowledge Management and Competitive Advantage of SMEs Using Neural Network and Structural Equation Modeling Approach**

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### **Extended Abstract**

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### **Introduction**

With the emergence of knowledge economics era, intangible assets become a vital source of competition for organizations. although assets and resources are prerequisite for the success of companies, their performance in knowledge management is a sufficient condition to develop business performance (Wheeler, 2002). In many recent studies, the role of knowledge management as a basis for business competitive advantage been emphasized, however, knowledge management is not the only source of long-term competitive advantage (Moustaghfir and Schiuma, 2013). Innovation as one of the factors influencing knowledge management, which has a significant role in value creation, has been noticed as a key source of competitive advantage (Lee et al., 2016). Recent studies in the field of knowledge-based innovation have considered innovation (continuous and technological) as the best way to achieve competitive advantage (Martín-de Castro et al., 2011). Studies of small and medium-sized enterprises (SMEs) have also confirmed that small firms cannot compete with economies of scale. The competitive advantage of these companies is based on innovative processes and products that depend on appropriate market and customer information. In this study, using two approaches of structural equation modeling and neural network, the determinants of SMEs achievement to competitive advantage have been investigated.

## **Objective**

SMEs have been described as a major driver of the Iran's economic growth. They constitute more than 80% of the private industrial enterprises and employing more than 60% of the working population. However, despite the emphasis of the fourth and fifth development plans on the growth and development of SMEs, their situation seems unfavorable. It seems that one way to get out of this situation is to achieve a competitive advantage. The objective of the research is to investigate the determinants of the SMEs competitive advantage by using structural equation modeling (SEM) and artificial neural networks (ANN).

## **Data/Methodology**

The current study is an applied research in terms of purpose and descriptive-correlation in terms of implementation method. In this study small and medium sized enterprises (SMEs). In Rasht, Sepidroud industrial town has 127 companies, 64 of SMEs. Also, Rasht industrial city has more than 280 industrial units, among which there were 170 active SMEs. Accordingly, the statistical population of the research includes SMEs in Sepidroud industrial town and Rasht industrial city with 234 companies. Based on the Cochran's formula 118 out of 234 SMEs were selected as the sample size. Then 148 questionnaires were distributed by random sampling method among the managers of SMEs where 124 filled questionnaires were collected. The questionnaire includes 35 questions in 4 sections: knowledge management (18 questions: Lopez et al., 2006; Martinez-Costa and Jimenez-Jimenez, 2009), technology innovation (6 questions: Prajugo and Sohal, 2003), innovation Marketing (7 questions: Azkaya et al., 2015; Gupta et al., 2016) and Competitive Advantage (4 questions: Rao and Helt, 2005). To analyze the data and test the research hypotheses a PLS-ANN approach is used. The ANN model used in this research is the multilayer perceptron model.

## **Results/Findings**

The results of structural equation modeling show that knowledge management has a positive relationship with marketing innovation (0.842) and marketing innovation has a positive relationship with competitive advantage (0.239). The effect of the mediating role of marketing innovation was also examined using the Sobel test, which is confirmed by the mediation of the calculated statistic (2.6317).

The analysis of the effects of knowledge management (acquisition, sharing and application), technology innovation and marketing innovation on competitive advantage using artificial neural network also shows that due to the normalized importance, technology innovation is the first and market innovation is the second predictor of competitive advantage. Therefore, it is highly recommended that SMEs devote a sufficient portion of their annual expenses to activities related to technology and market innovations. Knowledge acquisition is the third important predictor of competitive advantage it means that SMEs need to make more efforts to acquire knowledge. Given the normalized importance, knowledge sharing is the fourth predictor of competitive advantage. obviously, increasing knowledge sharing among employees will lead to

increased competitive advantage. Although the application of knowledge is the weakest predictor of competitive advantage its share cannot be ignored.

### **Implications**

The results show that technological innovation is the stronger mediator between knowledge management and competitive advantage of SMEs. In addition, the effect of knowledge management through technology and marketing innovation on the competitive advantage is more than the direct effect of knowledge management on competitive advantage. Therefore, SMEs must make a commensurate investment in knowledge management, technology innovation, and marketing innovation in order to achieve competitive advantage. In other words, by allocating more resources to technology and marketing innovation, more competitive advantage can be achieved while reducing knowledge management costs.

**Keywords:** *Knowledge Management, technology innovation, marketing innovation, competitive advantage*

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