

An empirical study to investigate the effects of internal and external knowledge management on dynamic organizational skills through information technology tools

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ABSTRACT

These days, we see a tremendous change on business units through implementation of information technology equipment. The recent advances on technology have revolutionized technology and people start creating new ideas based on these advances. In this paper, we present an empirical study to investigate the impact of two internal and external factors on dynamic organizational skills through information technology equipment. The study uses a sample of 52 experts and using a questionnaire, we gather their insight about the proposed study. Structural equation modeling has been implemented and the results confirm that both internal and external factors influence dynamic organizational skills through information technology equipment. The study also uses freedman test to rank the factors and the results show that communication is the most important factor (4.41), followed by process (4.03), knowledge implementation (2.79), decision making (2.54) and human resources (1.22) is the last important factor.

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1. Introduction

These days, we see a tremendous change on business units through implementation of information technology equipment. The recent advances on technology have revolutionized technology and people start creating new ideas based on these advances. Knowledge management plays an essential role on developing efficient systems in various business organizations. There are literally various factors impacting the success of knowledge management. Makhsoosi et al. (2013) presented a study to measure the effect of six cultural based factors including management support, organizational affiliation, employee participation in decision-making, staff welfare organization and establishment, adaptation of new policies and organizational and internal organizational climate on establishment of

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knowledge management in some educational organizations in Iran. They reported that management support, staff welfare organization and internal organizational climate were among the most influential factors while other components did not represent any important impact on knowledge management implementation.

Azad et al. (2012) performed another survey by examining six factors associated with knowledge management including concept of knowledge, management, knowledge tools, knowledge measurement, change management, knowledge content. They used structural equation modeling to understand the relationship between entrepreneurship and knowledge management components. Based on their results of this survey, knowledge content was number one priority followed by knowledge tools and concept of knowledge. The other factors including management, knowledge measurement and change management were in lower levels of importance.

Akbari et al. (2012) explained strategic knowledge management as a necessity for some specific organization structure. Akbari et al. (2012) studied whether there was any relationship between organizational structure, in terms of recognition, focus and complexity, and strategic knowledge management. They demonstrated that there was a meaningful relationship between organizational structure and strategic knowledge management in their university case study.

Khalghani et al. (2013) performed an investigation on organizational structure, culture, and information technology as knowledge management infrastructural capabilities, and compared their significance and status quo in five medical research centers in Tehran, Iran. They reported that organizational structure had the most significant impact on the effectiveness of knowledge management initiatives, while information technology gained the least perceived impact.

Ahmadi et al. (2012) did another survey on the relationship between organizational structure and organizational agility in some insurance companies. They reported that there was a significant relationship between organizational agility and two dimensions of organizational structure but they did not find any relationship between complexity and organizational agility. Darvish et al. (2013) investigated the impacts of intellectual capital on other components and their impacts on organizational learning capability. Their results of this survey indicated that human capital, relational capital and learning capabilities had positive influence on organizational performance, relational capital positively impacted learning capability and human capital influenced positively on relational capital.

Asgarian (2012) studied relationship between knowledge management capacity and innovation performance. Ali et al. (2012) did another survey on the relationship between knowledge management practices and the organizational performance of Pakistan's telecommunication. They explained that knowledge management practices had positive and significant impact on organizational performance, which reflected that organizations that prefer knowledge management practices get beneficial outcomes than their competitors.

2. The proposed study

There are different internal factors including information technology (IT), which could reduce the likelihood of losing knowledge or dependency on a particular person (Davenport & Prusak, 2001) and it could be used by all members of firm (Schulz, 2009), it is widely distributed within organization and can also be used in administration level (Griffith & Harvey, 2007). In addition, members of organization could use IT for search purposes and create new knowledge (Schulz, 2009).

In terms of external factors, implementation of IT facilitates supply chain knowledge achievement and it can support accessing marketing knowledge, supply chain process improvement as well as better marketing planning (Teece et al., 2000, Zack, 2009). Based on the facts explained, we propose two main hypotheses, where each is divided into two sub-hypotheses as follows,

1. H_{1a} : Internal knowledge management (IKM) improves dynamic organizational skills (DOK).
2. H_{1b} : Internal knowledge management improves dynamic organizational skills in the presence of different information technology facilities.
3. H_{2a} : External knowledge management (EKM) improves dynamic organizational skills.
4. H_{1b} : External knowledge management improves dynamic organizational skills in the presence of different information technology facilities.

External knowledge management includes customers, suppliers, competitors and Fig. 1 demonstrates the framework of the proposed study of this paper,

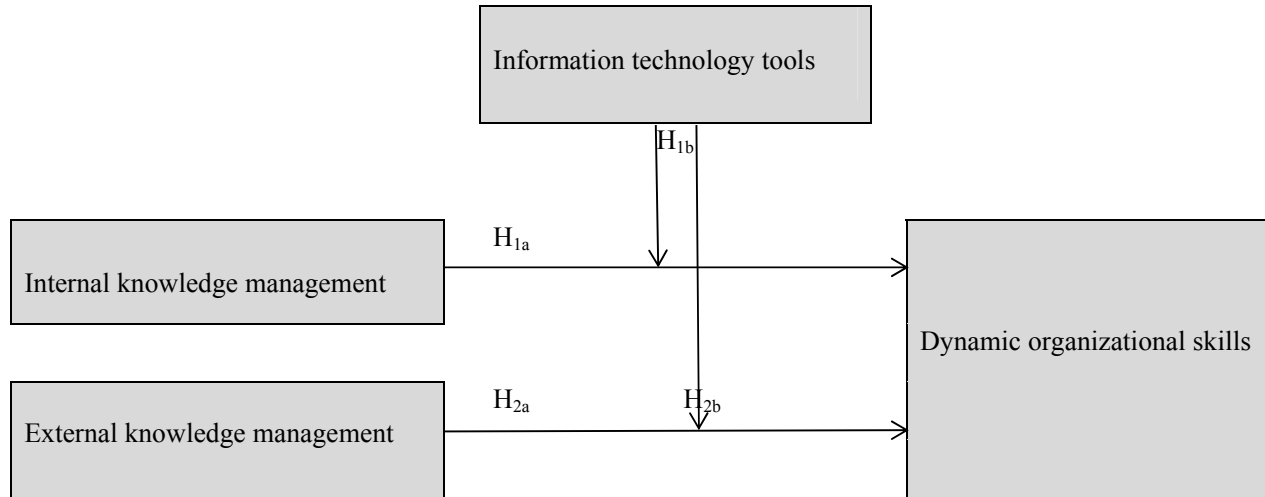


Fig. 1. The proposed study of this paper

Dynamic organizational skills includes upgrading effective learning and quality of decision making, improvement of communication skills and required responsiveness, integrated product development, upgrading knowledge and establishment of new resources. Therefore, we could expect better customer relationship management, more trust to sales people and improved strategies. Table 1 shows details of tools used for IT implementation.

Table 1
Different IT tools

Group	Tool
Human resources	1 Employee Competence database
	2 Exogenous professional database
Decision making	3 Groupware for discussion
	4 Decision support system
Implementation of Knowledge	5 Expert network
	6 Case-base experience database
	7 Documentation management
	8 Online knowledge searching
	9 Data warehousing
	10 Online learning
Process	11 Workflow software
	12 Enterprise resource planning
	13 Supply chain management
Communication techniques	14 E-mail
	15 Enterprise portal site
	16 Teleconferencing
	17 Customer relationship management (CRM)

To test the hypotheses of the proposed study of this paper, we design a questionnaire and distribute them among some experts who had extensive experiences in management field in different industries located in province of Khorasan Razavi located in east part of Iran. The proposed study uses the following formula to calculate the minimum number of sample size,

$$n = \frac{N \times z_{\alpha/2}^2 \times p \times q}{\varepsilon^2 \times (N - 1) + z_{\alpha/2}^2 \times p \times q}, \tag{1}$$

where N is the population size, $p=1-q$ represents the yes/no categories, $z_{\alpha/2}$ is CDF of normal distribution and finally ε is the error term. Since we have $p=0.5, z_{\alpha/2}=1.96$ and $N=60$, the number of sample size is calculated as $n=52$. We use structural equation modeling to examine different hypotheses of this study.

3. The results

In this section, we present details of our implementation of the structural equation modeling using LISREL software package.

3.1. Testing the first hypothesis: Internal factors and dynamic organizational skills

Fig. 2 shows details of our findings associated with the first hypothesis,

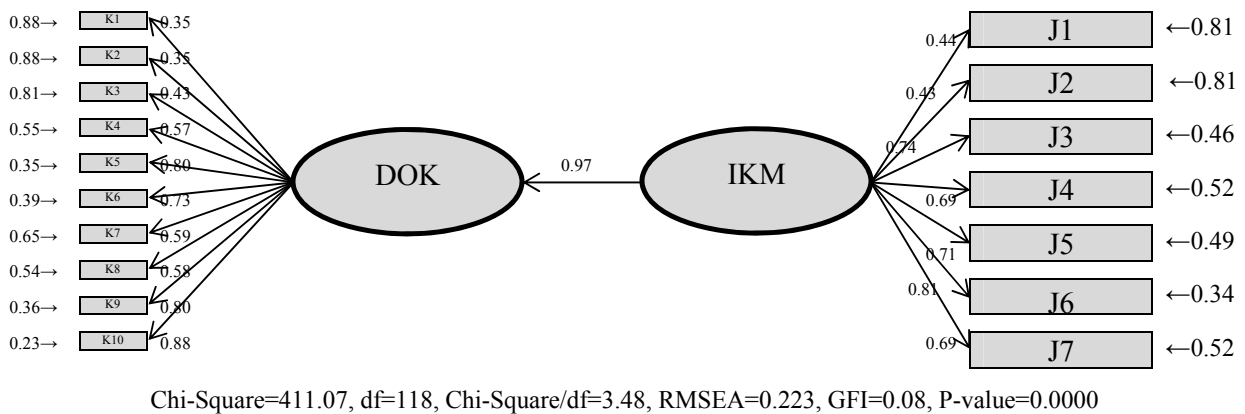


Fig. 2. The results of testing the first hypothesis of proposed method in standard form

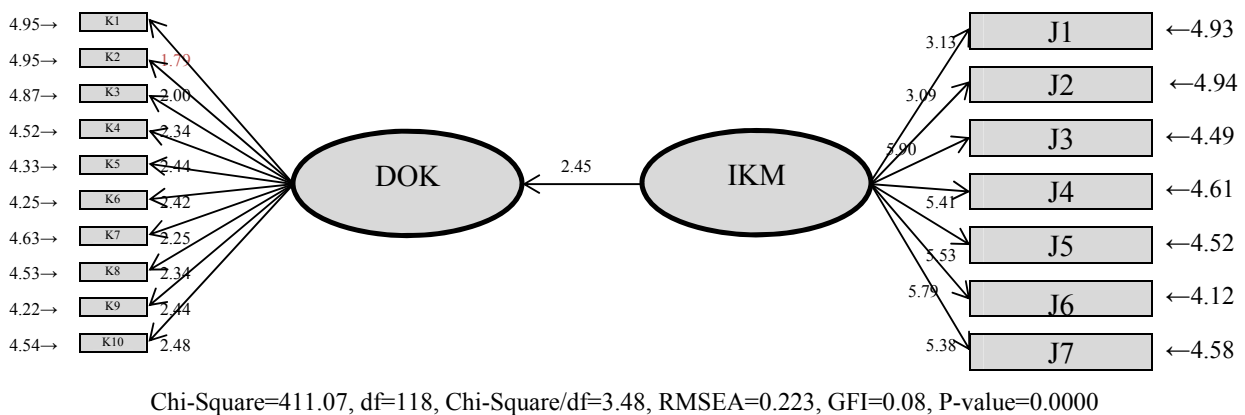


Fig. 3. The results of t statistics for testing the first hypothesis of proposed method

As we can observe from the results of Fig. 2 and Fig. 3, all statistical observations are within acceptable limit and we can reject the null hypothesis for the first hypothesis leaving us to conclude that internal knowledge management (IKM) improves dynamic organizational skills (DOK).

3.2. Testing the second hypothesis: External factors and dynamic organizational skills

Fig. 4 shows details of our findings associated with the second hypothesis,

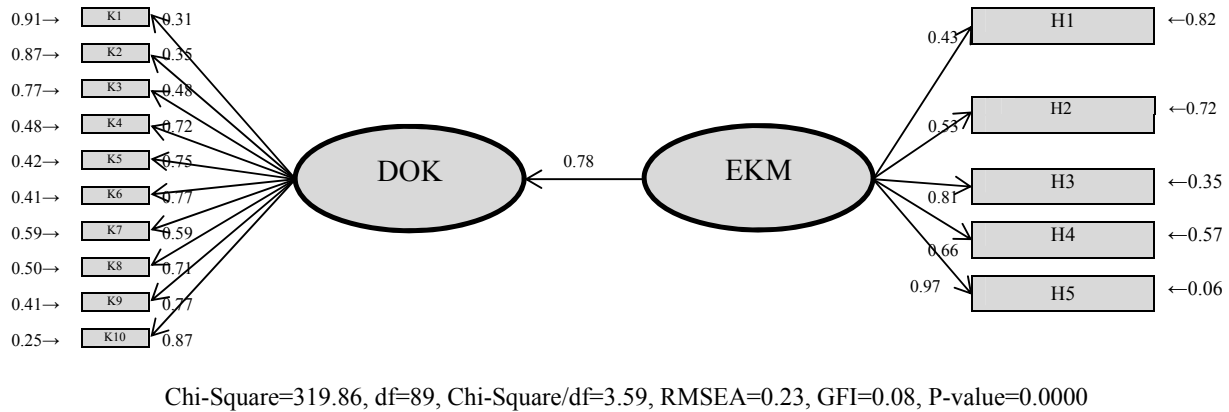


Fig. 4. The results of testing the second hypothesis of proposed method in standard form

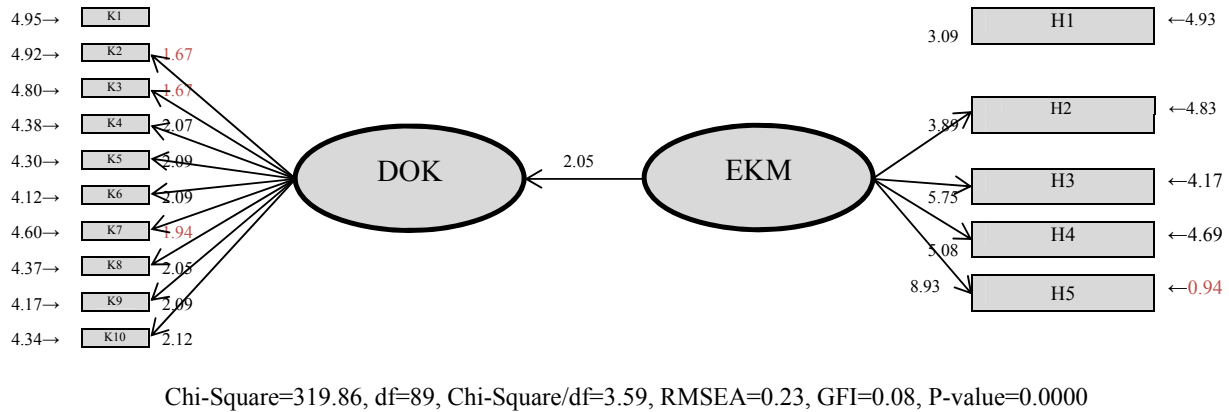


Fig. 5. The results of t statistics for testing the second hypothesis of proposed method

As we can observe from the results of Fig. 4 and Fig. 5, all statistical observations are within acceptable limit and we can reject the null hypothesis for the second hypothesis leaving us to conclude that external knowledge management (EKM) improves dynamic organizational skills (DOK).

3.3. Freedman test: Ranking different factors

We have also performed Freedman test to find out the relative importance of different factors on dynamic organizational skills and in our survey, communication is the most important factor (4.41), followed by process (4.03), knowledge implementation (2.79), decision making (2.54) and human resources (1.22) is the last important factor.

4. Conclusion

In this paper, we have presented an empirical study to investigate the impact of two internal external factors on dynamic organizational skills. The study has implemented structural equation modeling to study the impact of internal and external factors on dynamic organizational skills through information technology equipment. The study also used freedman test to rank the factors and the results showed that communication was the most important factor (4.41), followed by process (4.03), knowledge implementation (2.79), decision making (2.54) and human resources (1.22) was the last important factor.

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