

Creation, Transfer and Application of Knowledge and its Importance for Business Innovation and Organizational Performance

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Abstract. This study pursues to advance understanding and to provide empirical evidence of how knowledge management can affect business innovation improving performance of the firm. Such knowledge management components as creation, transfer and application of knowledge, and its importance for business innovation and organizational performance are analyzed at theoretical and empirical level. The predicted effects are tested with data collected through 160 firms of 10 European countries (Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Poland, Spain and United Kingdom). Results of this investigation confirm that 1) knowledge management and organizational learning are closely related and have effects on business innovation and organizational performance, 2) business innovation improves company performance.

Keywords: Knowledge Management, Organizational Learning, Innovations, Organizational Performance.

1. Introduction

In the last years knowledge management and business innovation have acquired remarkable attention (Chilton and Bloodgood, 2010; Plessis, 2007). It is widely accepted in the literature that innovation is core element of organizations (Plessis, 2007) and knowledge management is an important antecedent of innovation (Plessis, 2007). Concept of knowledge management involves managing learning process of members of an organization. Therefore, it includes organizational learning (related to the creation of new knowledge), besides processes related to creation, transfer, and application of existing knowledge in the company (Darroch, 2005; Kuo, 2011; Nonaka and Takeuchi, 1995; Raymon and Blili, 2000). Thus, successful organizations are considered those that have the capacity to learn and do it faster (Stalk, Evans and Shulman, 1992). In addition, a number of authors have recognised the importance of the relationship between organizational learning and innovation.

Despite there are many studies concerning knowledge management, organizational learning and innovation, it is difficult to find scientific works that empirically examine relationship between both constructs. So considering the need to increase managers and scholars' concerns about these important topics and due to great scientific interest on knowledge management, organizational learning and innovation (e.g.; Chilton and Bloodgood, 2010; Kuo, 2011; Plessis, 2007) the aim of this paper is to extend our understanding about how processes of knowledge management and organizational learning affect business innovation and the effects of this relationship on organizational performance. Thus this paper contributes in important ways to the analysis of relationship between knowledge management, organizational learning and innovation.

2. Theoretical Background

2.1. The Influence of Knowledge Creation on Knowledge Transfer

According to Nonaka and Takeuchi (1995) to be able exploiting knowledge created in the organization it needs to be transferred throughout the firm, so both knowledge' components are critical for firms (Cohen and Levinthal, 1990). According to Jonas (2003) in order to get a valuable created knowledge, a team or individual must transfer the new knowledge. That means knowledge created by members of organization will be unrealized if it is not transferred (Cohen and Levinthal, 1990). Plessis (2007) have argued if knowledge created by the firm is transferred within the firm it makes more difficult for competitors to replicate it and

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consequently it is more valuable and easier to code, especially the tacit knowledge. Syed-Ikhsan and Fitto, (2004) analysed five main groups of factors to explore the relationship the creation and knowledge transfer and they concluded that knowledge creation become a critical factor to transfer of knowledge in an organization. Thus, we propose Hypothesis 1: Knowledge creation will be positively related to knowledge transfer.

2.2. The Influence of Knowledge Creation on Application of Knowledge

Knowledge creation can affect application of knowledge in the organization (e.g. Andreeva and Kianto, 2011). Thus as Jonas (2003) suggested organizations efficacious in creation of knowledge possess more varied knowledge base that can stimulate its use from the diversity viewpoints of the organization. Datta (2007) has focused on how knowledge is transformed from creation to application. For this author knowledge creation is an essential activity to raise application of knowledge. Thus it is necessary knowledge application in addition to knowledge creation that leads to innovations (Nonaka and Takeuchi 1995). In addition, the study of Darroch (2005) has shown empirical evidence of the positive impact of knowledge creation on knowledge use. Also Yli-Renko et al. (2001) proposed knowledge creation increases the potential utilization of knowledge. Thus, we propose Hypothesis 2: Knowledge creation will be positively related to application of knowledge.

2.3. The Influence of Knowledge Creation on Business Innovation

Knowledge creation is a critical factor to innovate and achieve competitive success Hsiaoping (2008). This author pointed knowledge creation from interaction of partners of the firm facilitates knowledge codification and it reinforces firm's innovation. As Jonas (2003) remarked it is crucial for the firm to be able to improve the innovative climate. According to Nonaka and Takeuchi (1995) the capacity of organizations to innovate lies in their capacity to generate new knowledge. Thus knowledge creation is therefore perceived as one of the major assets of innovative organizations (Merx-Chermin and Nijhof, 2005), so the better understanding the process of creating knowledge, the more likely innovative behaviors can be fostered in organizations (Krogh et al.2000). Moreover, Cambra et al. (2011) have found inter-industry networks can be utilized jointly to create new knowledge that facilitates a successful technological innovation. Thus, we propose Hypothesis 3: The knowledge creation will be positively related to the business innovation.

2.4. The Influence of Knowledge Transfer on Knowledge Application

Knowledge transfer is closely related to knowledge application (Cohen and Levintahl, 1990). Firms with extensive knowledge management tended to encourage knowledge transfer by training of their employees in knowledge management systems, to make easier the application of this knowledge on the firm. Transferred knowledge is used by organization to model new solutions based on the new knowledge or to test good ideas (Darroch, 2005), thus best practices can be used by different firm's sub-units (Cohen and Levintahl, 1990). In this sense Savory (2006) have shown knowledge transfer facilitates the learning of a new competence through the application of existing knowledge in the organization. Dits and Berkhout (1999) summarized how knowledge is transferred into knowledge applications: 1) many technologies integrated into one product; 2) many Scientifics knowledge integrated as input into one technology; 3) one technology to many scientific research disciplines; and 4) one innovative product that facilitates the development of technologies. Thus, we propose Hypothesis 4: Knowledge transfer will be positively related to knowledge application.

2.5. The Influence of Knowledge Transfer on Organizational Learning

Knowledge transfer is an action that takes the knowledge as input and output the learning of a new knowledge Hsiaoping (2008). Costanzo and Tzoumpa (2008) have analyzed knowledge and learning by levels and shown knowledge transfer plays critical role in organizational learning. This process "occurs in different organizational settings such as informal inter-firm relations, communities of practices, and product development teams" (Costanzo and Tzoumpa, 2008: 150). They focused on organization's teams where knowledge transfer and learning is favored by coordination and interaction of their members and by the awareness, the manager's intuition and codifying and assessing results.

Knowledge transfer is necessary to lead changes in the organizational behavior by organizational

learning, so if learning does not result in changes in behavior, then "genuine transference has not taken place" (Sun and Scott, 2003: 204).

According to Pun and Nathai-Balkissoon (2011) knowledge transfer is integrally linked with organizational learning and both are related fields that have a large number of papers submitted from the past decade. Thus, we propose Hypothesis 5: Knowledge transfer will be positively related to organizational learning.

2.6. The Influence of Knowledge Application on Organizational Learning

Knowledge application implies to encourage learning by introducing into practice different elements, thus members of organization extract, translate, transform, and apply the knowledge for active and continuous learning (Datta, 2007). The application of knowledge is not a static one, it is dynamic, and is part of a process of continuous learning. It is the results of the application of the knowledge that enables the organization to learn, rather than the knowledge itself. Applications of knowledge support changes in attitude and behavior that support organizational learning (Krogh et al. 2000). Members of organizations can adapt use of knowledge according their preferences, providing successful learning opportunities (Chilton and Bloodgood, 2010). Kuo (2011) have shown the technological companies should utilize organizational knowledge in order to enhance organizational learning and performance. Thus, we propose Hypothesis 6: Knowledge application will be positively related to organizational learning.

2.7. The Influence of Organizational Learning on Innovation

Vakola (2000) have shown companies use organizational learning and innovation to solve existing problems but also to improve their status continuously in the face of changing conditions, primarily in the construction industry. According this study organizational learning implies the capacity of change and consequently improving the process innovation, since significantly improved technological capabilities and new approaches to organizing the companies are considered.

Innovation activities are influenced by the learning environment. As the result, organizational learning is one of the critical factors that sustain an organization's innovative ability (Kuo, 2011: 584).

Costanzo and Tzoumpa (2008) have found organizational learning is a critical process for innovation when the rate of technological change is rapid and the nature of future competition and market is difficult to determine, especially in organization's teams. The study by Pun and Nathai-Balkissoon (2011: 217) has also revealed that "there has been a shift from a focus on incremental and adaptive learning in the 1990s to recognition, in the past decade, of the added value to be gained from innovative learning". Thus, we propose Hypothesis 7: Innovation will be positively related to organizational learning.

2.8. The Influence of Innovation on Organizational Performance

Chang and Ahn (2005) found utilization of knowledge within the firm positively affected performance. Thus knowledge use rushes the "spiral of innovation" and guarantees better business performance. Darroch (2005) has provided empirical evidence that the effectively manage of knowledge makes firms be more innovative and with better perform.

A positive relationship between innovation and performance is fairly well established in the extant literature (e.g. Chilton and Bloodgood, 2010; Darroch, 2005). Firm innovation capability is the most important determinant of product performance. Thus, we propose Hypothesis 8: Innovation will be positively related to organizational performance.

3. Methodology

The aim of this study is contrast of the developed model that reflects how knowledge management components and organizational learning affect business innovation, and from here, to performance of the organization. Surveys were mailed to the 2200 selected high tech sector organizations from the database Amadeus (2010) that collected organizations with highest volume of operations around the world. We use an international sample of 160 firms from ten European countries (Spain, Italy, Germany, Austria, Belgium, Denmark, France, United Kingdom, Netherlands and Poland) in January-September of 2009. Response rate

was 13.75%.

Likewise, a series of chi-square and t-tests revealed no significant differences due to geographical location or size in variables studied. Since all measures were collected with the same survey instrument, possibility of common method bias was tested using Harman's one-factor test (Konrad and Linnehan, 1995). A series of tests (e.g. tolerance, variance inflation factor) shows the non-presence of multicollinearity (Hair et al., 1999). (see Table 1).

Table 1. Measurement model results

Variables	Items	λ^*	R ²	C.R.	AVE	Goodness of Fit Statistics
Knowledge Creation	SECI1	0.81***(22.39)	0.66	0.851	0.590	
	SECI2	0.69***(16.11)	0.50			
	SECI3	0.78***(20.51)	0.61			
	SECI4	0.78***(20.29)	0.60			
Knowledge Transfer	TRANSF1	0.84***(25.83)	0.70	0.876	0.702	
	TRANSF2	0.82***(25.11)	0.68			
	TRANSF3	0.85***(27.28)	0.73			
Knowledge Application	UT1	0.83***(28.45)	0.69	0.938	0.794	
	UT2	0.97***(76.00)	0.94			
	UT3	0.94***(58.95)	0.89			
	UT4	0.81***(26.60)	0.66			
Organizational Learning	OL1	0.93***(32.56)	0.71	0.954	0.735	
	OL2	0.87***(85.00)				
	OL3	0.83***(55.56)				
	OL4	0.82***(36.11)				
Organizational Innovation	I1	0.75***(19.45)	0.56	0.896	0.635	
	I2	0.71***(17.74)	0.50			
	I3	0.84***(28.82)	0.71			
	I5	0.88***(32.31)	0.78			
	I6	0.79***(22.78)	0.63			
Organizational Performance	PERF1	0.90***(43.18)	0.80	0.933	0.733	
	PERF2	0.92***(50.69)	0.84			
	PERF3	0.89***(41.93)	0.80			
	PERF4	0.82***(28.06)	0.67			

Notes: λ^* = Standardized Structural Coefficient (t-students are shown in parentheses); R²=Reliability; C.R.=Composite Reliability; AVE=Average Variance Extracted; *** $p < 0.001$ (two-tailed).

4. Results and Conclusions

Firstly, we could say that all hypotheses were accepted. The results of the research provide empirical evidence to support theoretical arguments about how knowledge management components enhance the effects business innovation on organizational performance. These results reinforce knowledge management and business innovations are fundamental assets that increase the value of the company (Chilton and Bloodgood, 2010; Darroch, 2005). Our results show that knowledge management component generate superior innovation that allows the firm to improve its organizational performance.

Results show that knowledge creation positively affects knowledge transfer and knowledge application. Knowledge creation enables the firm exploit new opportunities, moreover when this knowledge is transferred throughout the firm (Chilton and Bloodgood; 2010; Plessis, 2007; Yli-renko et al., 2001) and it also contributes positively to utilization of knowledge.

Secondly, our findings show that knowledge transfer positively affects knowledge use. Managers could promote training of their employees in knowledge management systems to make easier the application of this knowledge on the firm, and making concepts and methods more valuable and understandable to members of organization and facilitate their dissemination. Again best practices can be used by different firm's sub-units (Cohen and Levintahl, 1990).

Thirdly, transfer and application of knowledge positively affects organizational learning. Both are related and linked fields that encourage members of the organization by introducing into practice different elements and changes in attitude and behavior to keep the continuous learning.

Fourthly, we also demonstrate that knowledge components and organizational learning are strongly related to business innovation and organizational performance. Therefore managers should encourage employees to use knowledge rapidly and effectively because this knowledge represents a valuable asset to innovate improving results of the company.

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