

Knowledge Creation, Organizational Learning and Their Effects on Organizational Performance

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Knowledge has become one of the most important intangible assets for the company in the current competitive environment (Nonaka, 1994; Hunt, 1995; Grant, 1996; Hunt & Morgan, 1996; Teece, 1998; Lee & Sukoco, 2007; Li et al., 2009), being of particular importance knowledge creation processes within an organization (Nonaka, 1994; Nonaka & Konno, 1998; Nonaka et al., 2000) to achieve long-term competitive advantage (Nevis et al., 1995; Davenport & Prusack, 1997; Chow et al., 2000; Gold et al., 2001; Lin & Lee, 2004; Hicks et al., 2007).

Furthermore, learning is at the heart of corporate governance and it has become the essence of productive activity that has new rules, new boundaries and new ways of behaving (García et al., 2009). Thus, one of the strategic values of an organization lies in becoming a “learning organization”. These organizations have an enterprise architecture that converts the firm into a place of learning, so the organization can make appropriate approaches to changing environment (Kogut & Zander, 1996; García et al., 2007).

The concept of knowledge management involves managing the learning processes of individual and collective members of an organization. Therefore, it includes organizational learning (related to the creation of new knowledge), and most processes related to the acquisition of knowledge from outside, dissemination, storage and exploitation of knowledge at the firm (Day, 1992; García et al., 2009).

So this paper analyzes how the 4 modes of knowledge conversion model proposed in the “knowledge creating organization” (Nonaka & Takeuchi, 1995): Socialization, Externalization, Combination and Internalization (SECI) affect organizational learning and the results of the organization. Analyzing a sample of 284 Spanish companies, we propose a model to analyze this relationship. The results show (1) a positive relation between the modes of knowledge creation, (2) knowledge creation influences organizational learning as an essential part of Knowledge Management (García et al., 2007; García et al., 2009), (3) knowledge creation and organizational learning can create a new approach of continuous improvement leading to the increase of organizational performance (Senge, 1990; Peters, 1992).

Keywords: *knowledge management, knowledge creation, organizational learning, organizational performance, SECI model.*

Introduction

In the current competitive environment characterized by a turbulent, rapidly changing, intense global competition and high uncertainty (Zahra & George, 2002) to have competitive advantages for improving and maintain the competitive position over time is critical for any organization. In this new situation knowledge has become one the most important intangible assets for the company since it is accumulated through organizational learning, and is difficult to imitate (Winter, 1987; Prahalad & Hamel, 1990; Leonard-Barton, 1992, 1995; Henderson & Cockburn, 1994; Nonaka, 1994; Kogut & Zander, 1996; Nonaka & Toyama, 2003; García et al., 2007). To maximize the value of knowledge is important for managers (Uziene, 2010) since knowledge management allows the firm to influence core competences and obtain competitive advantage in a long term, the creation of knowledge within organization being of particular importance for this process (Nonaka, 1994; Nonaka & Konno, 1998).

To have the capacity to generate new knowledge is vital for organizational learning (Nonaka & Konno, 1998). Nowadays, successful organizations are considered those that have the capacity to learn and do it quickly (Stalk et al., 1992). Possessing an ability to learn and anticipate in markets is currently a core competence because we face a process of introducing new products with shorter half-life and greater competition, which requires a rapid response capacity to retain and capture new customers beating competitors, so with this purpose firms must use a learning initiative targeted to different markets (Day, 1992, 1994). All these aspects suggest the ability to learn to be major sustainable competitive advantage (Senge, 1990; Day, 1992; Kiernan, 1993).

Due to the importance of such themes to the organization, the **aim** of this research is to increase knowledge about the four modes of knowledge conversion and their influence on organizational learning and performance. We propose an empirical model to analyze how modes of knowledge conversion (Nonaka & Takeuchi, 1995) affect organizational learning and to examine the joint influence of these variables on the performance of the company, analyzing the key relationships between these variables with a comprehensive model.

Research object is the relation between SECI model of knowledge creation and organizational learning.

Research method. The paper is built by the theoretical review of scientific literature on SECI model and organizational learning, and a structural equations modeling was performed to estimate direct and indirect effects of relations between constructs.

Theoretical framework and proposals

The model of creation of knowledge more popular and widely cited in Knowledge Management is probably the Nonaka and Takeuchi's model (Nonaka 1994; Nonaka et. al. 1994; Nonaka & Takeuchi 1995; Nonaka et. al. 2000; Nonaka & Toyama 2003). Nonaka & Takeuchi (1995) explain it in their book "The Knowledge-creating company", i.e. how Japanese companies in the 80s were innovated by interacting the explicit and tacit knowledge. It pays close attention to the process of knowledge creation and begins by distinguishing two dimensions in this process of creation:

1. The epistemological dimension, to distinguish between tacit and explicit knowledge has its origin in Polanyi (1958, 1967). This classification is most used and it has been further developed by Nelson & Winter (1982) in his evolutionary theory of the firm, and by other authors as Kogut & Zander (1992), Hedlund (1994), Grant (1996), Teece (1998) and Zack (1999), among others. Distinction between tacit and explicit knowledge should not be considered as two separate types of knowledge, but as two possible states of knowledge (Guía, 1999). Tacit knowledge is a "set of subjective perceptions, intuitions, rituals, insights that are difficult to express in a semantic, auditory or visual way" (Byosiere, 1999, 82) and therefore, it is difficult to formalize, communicate and share with others, and consequently to be copied. It is deeply rooted in an individual action and experience, as well as in ideals, values or emotions that a person takes (Nonaka, 1991; Nonaka & Takeuchi, 1995; Nonaka & Konno, 1998) and in his context. Explicit knowledge is structured knowledge, bit ambiguous and easy way to improve. It is objective, rational, theoretical, systematic, and can be transmitted more quickly, easily and with less cost. Competitive advantages based on it are easier and less hard to imitate. It is expressed in a formal and systematic language, written, auditory or visual way because it can be collected and shared as data, formulas, specifications and manuals (Byosiere, 1999).

2. The ontological dimension recognizes different fields of knowledge, classifying knowledge as individual (it exists in the minds and physical abilities of individuals, it is specific in context and personal) and social (it lies in rules, procedures, routines and norms that are often shared collectively at a group, organizational and interorganizational level) (Nonaka, 1994; Nonaka & Takeuchi, 1995). Individual knowledge is embodied in the person, so it is vital for creation (Nonaka & Takeuchi, 1995; Grant, 1996) and it can be the sustenance of collective knowledge (Von Krogh et al., 1994) because it incorporates into their common heritage skills such as oral, written and body language that facilitate its collective transmission. Collective knowledge is more than the sum of individual knowledge (Fiol & Lyles, 1985). It is shared by the members of an organization, and therefore it does

not depend on any particular individual. It is critical for the survival of a firm (Spender, 1996). Currently there is no unanimity about the number of existing levels of knowledge, so we can find papers in which there are four different knowledge agents: individuals, groups, organization and the interorganizational domain - customers, suppliers, competitors- (Nonaka, 1991; Nonaka & Takeuchi, 1995) or just the first three (Crossan et al., 1999). The fourth level reflects relational learning, which encourages more fruitful development of this activity in terms of quality and quantity, because the relationship with suppliers, customers, competitors, associations and other organizations allows the company and its members expand their vision, information base, their learning, and this leads ultimately to knowledge. But there is an agreement about each level to have tacit and explicit knowledge (Martínez & Ruíz, 2006).

Thus, knowledge is created when there is the transformation of tacit knowledge of individuals into explicit knowledge at group and organizational level (Nonaka, 1994; Nonaka & Takeuchi, 1995) and each member of such groups internalize it, making it tacit knowledge again. Then we analyze the process of transforming individual knowledge into organizational. This means knowledge conversion, which is part of the spiral of knowledge. It also considers four possible modes of conversion for the two types of knowledge: socialization, externalization, combination and internalization (Figure 1).

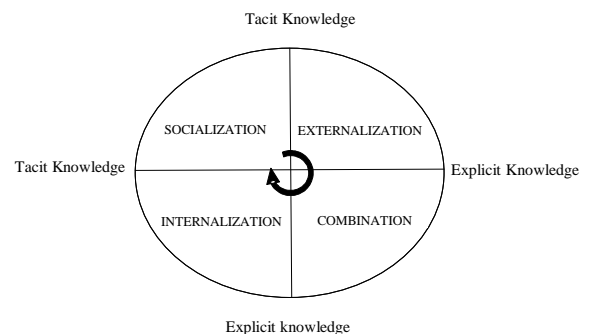


Figure 1. Four alternatives for the creation of knowledge

Source: Nonaka & Takeuchi (1995)

Socialization (tacit to tacit knowledge) is a process of sharing experience (way of thinking or technical gestures) while creating knowledge. It is to share tacit knowledge and experience possessed by individuals with other group members, through practical exercise and physical proximity. To achieve these results there are two distinct and key activities (Nonaka & Konno, 1998): capturing knowledge through interaction with external agents (clients and suppliers) and internal (organizational members), from physical proximity or virtual interaction, and the dissemination of knowledge, transferring individual knowledge to other person (Martínez & Ruíz, 2006). Self-directed teams are very useful tools here (Nonaka, 1994; Nonaka & Takeuchi, 1995).

Externalization (tacit to explicit knowledge) is a process of formalization of tacit knowledge in explicit concepts or understandable for organization or any individual, through the own articulation of this one and its move to support quickly understandable (Nonaka & Konno, 1998). Dialogue and deductive and inductive techniques such metaphors, analogies, or construction of archetypes and stories shared (Nonaka, 1991; Nonaka & Takeuchi, 1995) facilitate the expression of ideas or images in words, concepts, figurative and visual language and they are basic tools that support externalization.

In socialization and externalization knowledge is shared within the organization. The socialization of tacit knowledge from collective experiences and mental models is disseminated in the company through externalization (Nonaka, 1994; Nonaka & Takeuchi 1995; Nonaka & Konno, 1998). To formalize explicit concepts the externalization needs tacit knowledge achieved through socialization (Nonaka & Konno, 1998) to share it in the organization (Nonaka & Takeuchi 1995; Nonaka & Toyama, 2003). Processes of socialization affect processes of externalization because the participants of these ones must share time and space to work through direct experience for the interaction of this tacit and explicit knowledge (Nonaka & Toyama, 2003). Therefore, tacit knowledge of socialization is articulated into explicit forms through externalization activities (Li et al., 2009).

Thus, we propose that:

Hypothesis 1: Socialization is to be positively related to externalization

Combination (explicit to explicit knowledge) is part of the process that synthesizes explicit concepts and brings them to a knowledge base through the following procedures (Nonaka & Konno, 1998): capture and integrating new essential explicit knowledge, through collection, reflection and synthesis; dissemination of this one through the transfer process commonly used in the organization, such presentations, meetings or emails; and processing by documents, plans, reports and market data. Thus, externalization needs combination "to embody knowledge in a form that is concrete enough to facilitate further knowledge creation in a wider social context" (Nonaka et al., 1994, 341). In combination the knowledge from externalization is shared within the organization, thus new superior explicit knowledge is disseminated in the company (Nonaka & Konno, 1998). The combination activities edit and integrate knowledge from externalization by using documents or databases to generate new knowledge application (Li et al., 2009). Firms can use a combination process to create new knowledge from the existing knowledge from externalization and generate new knowledge application (Nonaka et al., 2000).

Thus, we propose that:

Hypothesis 2: Externalization is to be positively related to the combination

Internalization (explicit to tacit knowledge) is the absorption of explicit knowledge into tacit. It is very similar to learning through practice. Internalization is facilitated if individual knowledge is explained in words or documented. Simulations are another way to achieve this

conversion. This internalization requires, firstly, the updating of the concepts or methods explicit and, secondly, the inclusion of such explicit knowledge into tacit (Nonaka & Konno, 1998) using some tools such as metaphor. But it is also necessary that explicit knowledge is lived or experienced, either from the personal experience of doing an activity, either through participation, simulations, or role-playing exercises, so that they internalize it in their own style and habits. In this way individuals use this stage to expand, extend and transform their own tacit knowledge, starting again a new cycle (Nonaka, 1991).

New explicit knowledge created by the combination should be assimilated by the members of the company in order to be used properly (Nonaka, 1994). Combination allows explicit knowledge to be captured in the phase of internalization by individuals that extend, expand and transform this knowledge explicit (Nonaka, 1994; Nonaka & Konno, 1998; Martínez & Ruiz, 2006). Through internalization, knowledge from the combination is transformed into organizational memory and is actualized in practical operations such as a new product development or manufacturing procedure (Nonaka et al., 2000). So, new higher explicit knowledge obtained and shared through the combination is applied and used in practical situations that are the basis of new organizational routines, and then new tacit knowledge is made by individuals of the organization through the process of internalization (Nonaka, 1991; Nonaka, 1994; Nonaka & Takeuchi 1995; Nonaka et al., 2000; Nonaka & Toyama, 2003).

Thus, we propose that:

Hypothesis 3: The combination is to be positively related to internalization.

Thus, epistemological and ontological dimensions make a model of "spiral" of knowledge (Figure 1), in which knowledge is created through the dynamic interaction between different modes of knowledge conversion. The first step is socialization, i.e., conversion of tacit knowledge to tacit. Then, this tacit knowledge becomes explicit through externalization. Then explicit knowledge is converted into a new explicit knowledge through the combination, and finally, internalization takes place, where explicit knowledge becomes tacit. This last step again begins the whole cycle of knowledge, but at a higher level. Therefore firms try the program sequentially: all knowledge creation steps are covered for getting successful strategies of knowledge (Duoba & Savaneviciene, 2004).

Nowadays, successful organizations are considered those that have capacity to learn and do it quickly (Stalk et al., 1992). "Seen from the vantage point of organizational knowledge creation, learning is a daily activity for the organization" (Nonaka, 1994, 19). We can analyze organizational learning as a process that detects the existing dysfunction by studying relationship between action and result, transforming experience into knowledge. It also examines the relationship between the organization and its environment or between the organization and memory. This notion of learning develops new skills and knowledge by increasing organizational capacity and performance (García et al., 2009). The concept of knowledge management involves managing processes of

individual and collective learning of members of an organization (García et al., 2007). Therefore, this concept includes organizational learning (related to the creation of new knowledge), further processes related to the acquisition of knowledge from outside, dissemination, storage and exploitation of existing knowledge in the company (García et al., 2009).

“The conversion of explicit knowledge into tacit knowledge, which bears some similarity to the traditional notion of learning even, it is referred as internalization” (Nonaka, 1994). Through a process of trial and error concepts are articulated and developed until they emerge in a concrete form. This “experimentation” can trigger internalization through the process of “learning by doing”. So “internalization has associations with organizational learning” (Nonaka, 1994, 19).

Thus, we propose that:

Hypothesis 4: Internalization is to be positively related to organizational learning.

Also socialization is related with organizational learning. “There has been an accumulation of research on modeling behavior in learning psychology” (Nonaka, 1994). Tacit and social knowledge is also disseminated and learned by the organization through routines and schemes of the organization to coordinate different components of the organization and giving them a productive use (Henderson & Clark, 1990; Spender, 1996). Socialization through shared experience facilitates the creation of common perspectives which “can be learned and shared by team members as a part of their respective bodies of tacit knowledge” (Nonaka, 1994, 24). It has also been demonstrated that socialization contributes high performance in functional departments (Kusunoki et al., 1998; Nonaka et al., 2000).

Thus, we propose that:

Hypothesis 5: Socialization is to be positively related to organizational learning.

Also many authors relate organizational learning with improvements in performance (Argyris & Schön, 1978; Fiol & Lyles, 1985; Dodgson, 1993; Bohn, 1994) or a behavior change that leads to improved performance (Fiol & Lyles, 1985; Senge, 1990; Garvin, 1993; Sinkula, 1994). Performance measures are essential for effective management of any organization (Griffis et al., 2007; Savaneviciene & Stankeviciute, 2010). Although there is little understanding about mechanisms by learning develops organizational performance (Snyder & Cummings, 1998), and not any improvement in performance comes from an organizational learning processes, fundamental purpose underlying knowledge management processes (and corresponding organizational learning) is always increasing quality and quantity performance, enabling the firm to sell further and better, achieve more and better support and create and retain best customers (Demarest, 1997). In short, learning is a major component in any effort to improve organizational performance and to achieve competitive advantages (Kogut & Zander, 1996).

Thus, we propose that:

Hypothesis 6: Organizational learning is positively related to organizational performance, so that the higher

organizational learning, the higher performance in the organization.

Methodology

The aim of this section is contrast of the developed model that reflects how the stages of the process of knowledge creation influence organizational learning, the latter effecting the performance of the organization. The sample was selected from the database Dun & Bradstreet Spain (2008) that collected 50.000 organizations with the highest volume of operations in Spain. The Spanish market is relatively well developed and wholly integrated in the European Union. Surveys were mailed to 1200 selected organizations along with a cover letter. We used this method because it enabled us to reach a greater number of organizations at a lower cost, to exert less pressure for an immediate reply, and to provide the interviewees with a greater sense of autonomy.

We present the technical details of the research in Table 1.

Table 1

Technical details of the research

Methodology	Structured Survey
Geographic Scope	National (Spain)
Sectorial Scope	All sectors
Sampling procedure	Random
Universe of population	1.200 firms
Sample responder size	284 firms
Responders	CEOs
Response rate	23,67%
Confidence level	95% (p - q) = 0,5; Z = 1,96
Sample Error	± 5.8%
Period of data collection	June 2008 –April 2009

The use of constructs has played an important role in designing a survey instrument in management research. Constructs used in this research are:

1. Socialization: We selected four items from the previous scales of Nonaka et al. (1994) and Lloria (2004), developed a confirmatory factor analysis to validate our Likert-type 7-point scale (1-“total disagreement”, 7-“total agreement”) of four items ($\chi^2_2=25.78$, RMSEA=.09, NFI=.99, NNFI=.98, CFI=.99, GFI=.99), which required deletion of the Item 3. This procedure allowed us to choose three items (Appendix) with high validity and reliability ($\alpha=.766$).

2. Externalization: we used scales designed by Nonaka et al. (1994) and Lloria (2004). We established a Likert-type 7-point scale (1-“total disagreement”, 7-“total agreement”) of three items (Appendix). Using a confirmatory factor analysis ($\chi^2_3=16.24$, RMSEA=.07, NFI=.98, NNFI=.97, CFI=.98, GFI=.99), we validated our scales and verified the scale’s unidimensionality, high validity and reliability ($\alpha=.702$).

3. Combination: we selected four items from the previous scales of Nonaka et al. (1994) and Lloria (2004), developed a confirmatory factor analysis to validate our Likert-type 7-point scale (1-“total disagreement”, 7-“total agreement”) ($\chi^2_3=25.78$, RMSEA=.05, NFI=.99,

NNFI=.99, CFI=.99, GFI=.99), which required deletion of the Item 3. This procedure allowed us to choose three items (Appendix) with high validity and reliability ($\alpha=.724$).

4. Internalization: we chose four items from scales designed by Nonaka et al. (1994) and Lloria (2004), established a Likert-type 7-point scale (1-“total disagreement”, 7-“total agreement”). Using a confirmatory factor analysis we validate it ($\chi^2_2=4.04$, RMSEA=.07, NFI=.98, NNFI=.97, CFI=.98, GFI=.99), which required deletion of the Item 1 and 2. We validated our scales and verified the scale’s unidimensionality, high validity and reliability ($\alpha=.792$).

5. Organizational learning: we use two first items from the scale by Kale, et al., (2000) and 3 items from the scale by García et al. (2009), and established a Likert-type 7-point scale (1-“total disagreement”, 7-“total agreement”). So, given a Likert-type 7-point scale (1 "totally disagree", 7 "totally agree") we use a confirmatory factor analysis ($\chi^2_2=26$, RMSEA=.47, NFI=.97, NNFI=.91, CFI=.97, GFI=.99), we validated our scales and verified the scale’s unidimensionality, high validity and reliability ($\alpha=.824$).

6. Organizational performance: having reviewed how performance is measured in different works of strategic research (Aragón et al., 2007; García et al., 2007; García et al., 2009), we drew up a scale that included 5 items to measure organizational performance. The literature has widely established that there is a high correlation and concurrent validity between objective and subjective data on performance, which implies that both are valid when calculating a firm’s performance (Venkatraman & Ramanujan, 1986; Homburg et al., 1999). We use a confirmatory factor analysis ($\chi^2_5=$ RMSEA=.12, NFI=.94, NNFI=.93, CFI=.98 GFI=.99), which required deletion of Item 5. We validated our scales and verified the scale’s unidimensionality, high validity and reliability ($\alpha=.821$).

The LISREL 8.70 program was used to test the theoretical model. We used a recursive non-saturated model taking the socialization (ξ_1) as the exogenous latent variable, externalization (η_1) as the first-grade endogenous latent variable, combination (η_2), internalization (η_3), organizational learning (η_4) and organizational performance (η_5) as the second-grade endogenous latent variables (Figure 2).

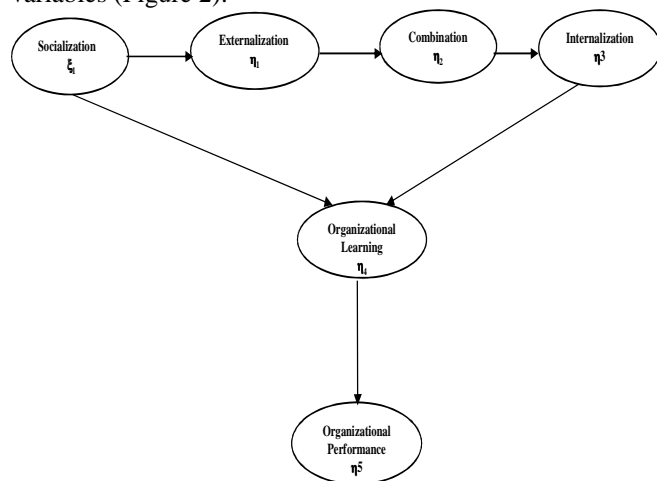


Figure 2. Hypothesized model

Through flexible interplay between theory and data, this structural equation model approach bridges theoretical and empirical knowledge for a better understanding of the real world. Such analysis allows modelling based on both latent and manifested variables, a property well suited to the hypothesized model, where most of the represented constructs are abstractions of unobservable phenomena. Further, structural equation modelling takes into account errors in measurement, variables with multiple indicators and multiple-group comparisons (Koufteros et al., 2009).

The overall fit measures, multiple squared correlation coefficients of variables (R^2), signs and significance levels of the path coefficients all indicate that the model fits the data very well ($\chi^2_{164}=393.25$, $p>.001$; $\chi^2_{ratio}=2.39$; NFI=.88; NNFI=.91; GFI=.96, CFI=.95, IFI=.95, PGFI=.75). The hypothesized model was a significantly better fit than the null model ($\chi^2_{190}=4405.25$, $p>.001$; $\Delta \chi^2_{26}=4012$, $p>.001$). All of the modification indices for the beta pathways between major variables were small, suggesting that adding additional paths would not significantly improve the fit. The residuals of the covariance were also small and centered around zero.

Structural equations modeling was performed to estimate direct and indirect effects using LISREL with the correlation matrix and asymptotic covariance matrix as input (Bollen, 1989). This type of analysis has the advantage of correcting unreliability of measures and also gives information on the direct and indirect paths between multiple constructs after controlling potentially confounding variables (Figure 3).

Speaking about the standardized parameter estimates, our findings show that socialization is highly related and affects externalization ($\gamma_{11}=.89$, $p<.001$) and also it is explained very well by the model supporting Hypothesis 1. Externalization is also highly related and affects combination ($\beta_{21}=.93$, $p<.001$), as was predicted in Hypotheses 2. Externalization is explained very well by the model. Furthermore, we have shown an indirect effect of socialization on combination (.83, $p<.001$) through externalization (.89x.93; see, for instance, Bollen, 1989 for calculation rules). Combination is also highly related and affects to internalization ($\beta_{31}=.92$, $p<.001$) supporting Hypothesis 3. Also socialization has an indirect effect on internalization (.76, $p<.01$) by externalization and combination (.89x.93x.92). Internalization is also highly related and affects to organizational learning ($\beta_{43}=.36$, $p<.001$) supporting Hypothesis 4. Globally, the importance of internalization is explained very well by the model. Furthermore we have found a direct effect of socialization on organizational learning ($\gamma_{41}=.54$, $p<.001$) that supports hypothesis 5, and also an indirect effect of socialization on organizational learning (.27, $p<.01$) by externalization, combination and internalization (.89x.93x.92x.36). Finally, organizational performance is directly influenced by organizational learning ($\beta_{54}=.13$, $p<.001$) and is explained very well by the model, supporting Hypothesis 6.

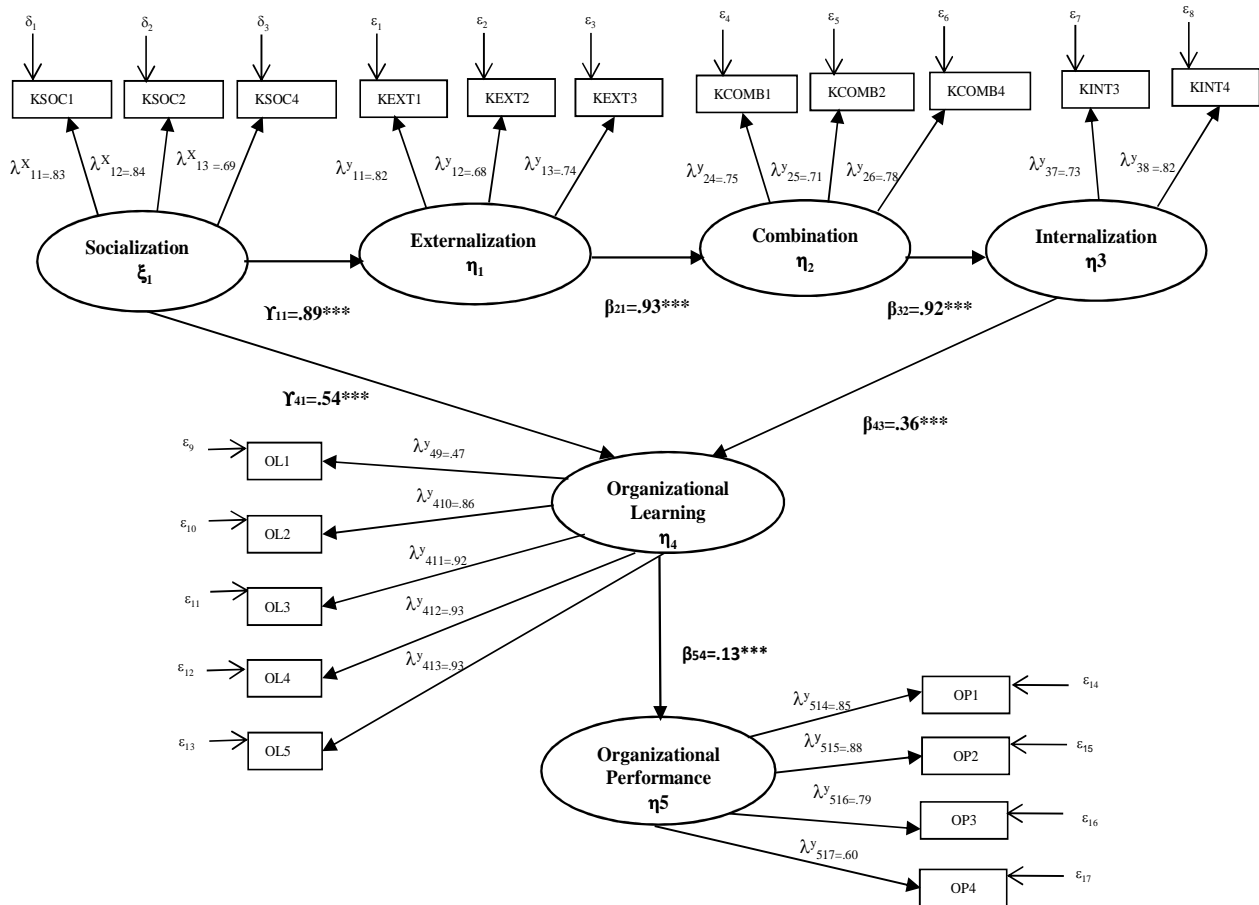


Figure 3. Results of structural equation model

Conclusions

This study develops a conceptual model to examine the relationship between knowledge creation process and organizational learning, and shows how both intangibles affect firm performance. The results show that four modes of the conversion of knowledge affect directly and indirectly organizational learning that means the greater presence of the processes of knowledge creation in the organization, i.e. organizational learning facilitates efforts to improve organizational performance. Thus, knowledge creation processes are related with organizational learning playing the key role improving organizational performance. To check these findings we have proposed a positive relationship between the four modes of knowledge conversion: socialization (H1), externalization (H1), combination (H2) and internalization (H3). This is the popular model of the creation of knowledge development by Nonaka and Takeuchi (1995). We have shown this model is related positively to organizational learning (H4, H5), and this one is directly related to organizational performance (H6). Also four modes of the conversion of knowledge have indirect effects on performance.

Our model put emphases on the creation of knowledge and organizational learning with the main objective of contrasting influencing factors and explaining relations

between these constructs. Furthermore, we explore whether the relationship between these variables affects organizational performance. All hypotheses were verified.

Our findings contribute to the development of scientific literature in several ways. First, our analysis confirms knowledge creation implies to manage learning processes of members of organization (Nonaka, 1994; García et al., 2009).

Second, for the set of hypotheses about the creation of knowledge the results are very significant, which confirms the close relationship between different forms of knowledge conversion and the creation of knowledge. Nonaka and Takeuchi (1995) proposed the creation of knowledge through the interaction of tacit and explicit knowledge between the four forms of knowledge conversion.

Third, organizational learning allows the firm to increase the quality and quantity of its performance and to achieve competitive advantage (Kogut & Zander, 1996).

Fourth, in general, at theoretical level we find enough literature that supports the main hypothesis of the relation between the creation of knowledge and organizational learning, and how the latter affects organization performance. Thus, our results add empirical evidence about direct and indirect effects of SECI model and organizational learning (e.g. Nonaka & Konno, 1998; García et al., 2009), and it reinforces the belief that these constructs allow the

creation of a new approach to continuous improvement leading to increases in corporate performance (Senge, 1990; Peters, 1992).

Fifth, with regard to organizational performance, the results provide empirical evidence on the existence of a positive and direct relationship between organizational learning and performance, and the existence of positive direct and indirect effects of four modes of the conversion of knowledge on performance. Such knowledge conversion enables firms to integrate emerging knowledge into its strategic development (Nonaka, 1994), and they can create new knowledge and develop new product at a lower cost and more speedily than competitors do (Droge et al., 2003). Thus, knowledge creation provides an opportunity for firms to enhance efficiency and sustain competitive advantages (Nonaka et al., 2000; Chia, 2003). Also organizational learning is the key element to get the best competitive advantages (Kogut & Zander, 1996).

Sixth, the knowledge creation process is critical because it indirectly influences performance such as our results confirm. So it could be important for an organization to have knowledge management systems that equip the company with greater ability to anticipate and make it more flexible to face increasing changes taking place in a competitive environment of high uncertainty.

Finally, our model only analyzes direct and indirect relationship between the creation of knowledge and organizational performance. Other factors could be analyzed as the transfer of knowledge, or information systems. However, it should be noted that strategic variables have been chosen to explain a significant amount of variance of organizational performance. More attention should be paid to the influence of specific strategic factors on organizational performance in the future. Empirical papers supporting (or rejecting) our results in different contexts would be welcomed (especially longitudinal studies). Future studies should be based on a larger sample, preferable in more than one country. It would also be interesting to study similar characteristics with the information provided by lower levels of management and employees in the organization.

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Appendix

Socialization

1. People of our company can break with traditional conceptions to see things in new and different way.
2. People try to understand way of thinking and acting of the rest of their colleagues.
4. In meetings, we seek to understand the viewpoint of all the people.

Externalization

1. Meetings are held periodically where all employees informed of developments that have occurred in the company.
2. Through compensation policies the system of human resource management encourages knowledge sharing across the firm.
3. The company produces regular written reports distributed to all staff where its progress is reported.

Combination

1. Files and databases of the company provide the information necessary to do the work.
2. Information systems make it easier for individuals to share information.
4. The necessary information can be obtained from the files and databases of the company.

Internalization

3. Usually external alliances and networks are established with other companies to promote learning.
4. Often the suggestions made by employees are incorporated into the processes, products or services.

Organizational Learning

1. The organization has learned or acquired lot new and important knowledge in the past three years.
2. Members of the organization have learned or acquired some skills or critical skills in the last three years.
3. Improvement of the organization has been influenced by the new knowledge acquired by the company over the past three years.
4. Our company is a Learning Organization.

Organizational Performance

Answer the following questions, taking into account your firm's situation in the last three years (1 "Totally disagree" 7 "Totally agree").

1. The organization has obtained high performance measured by return on assets (ROA).
2. The organization has obtained high performance measured by return on equity (ROE).
3. The organization has obtained high performance measured by return on sales (percentage of profits over billing volume or ROS).
4. The organization has obtained high sales growth in the main products/services and markets.

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Žinių kūrimas ir organizacijos mokymasis bei jų poveikis organizacijos veiklai

Santrauka

Dabartinėje konkurencinėje aplinkoje žinios tapo vienu iš svarbiausių neapčiuopiamu kompanijos turtu (Nonaka, 1994; Hunt, 1995; Grant, 1996; Hunt ir Morgan, 1996; Teece, 1998; Lee ir Sukoco, 2007; Li ir kt., 2009), o žinių kūrimo procesas yra svarbiausias aspektas organizacijoje (Nonaka, 1994; Nonaka ir Konno, 1998; Nonaka ir kt., 2000) siekiant ilgalaikio konkurencingumo pranašumo (Nevis ir kt., 1995; Davenport ir Prusack, 1997; Chow ir kt., 2000; Gold ir kt., 2001; Lin ir Lee, 2004; Hicks ir kt., 2007).

Be to, mokymasis yra organizacijos valdymo pagrindas ir produktyvios veiklos esmė, kuri priklauso nuo naujų taisyklių, ribų ir elgesio normų (García ir kt., 2009). Taigi vieną iš strateginių organizacijos vertybių – tapimas „besimokančia organizacija“. Tokios organizacijos turi tokią įmonės struktūrą, kuri paverčia firmą mokymosi vieta ir sudaro sąlygas besikeičiančiai aplinkai (Kogut ir Zander, 1996; García ir kt., 2007).

Žinių vadybos sąvoką sudaro organizacijos individų ir kolektyvo narių mokymosi procesų valdymas. Taigi į ją įeina organizacijos mokymasis (susijęs su žinių kūrimu ir daugeliu procesų, kurie susiję su žinių gavimu iš išorės, jų plėtra, išlaikymu ir panaudojimu pačioje firmoje) (Day, 1992; García ir kt., 2009).

Žinių kūrimo modelis yra populiarai ir plačiai cituojamas žinių vadyboje ir pateikiamas kaip Nonaka ir Takeuchi's modelis (1995).

Šio tyrimo tikslas – praplėsti žinias apie keturis žinių keitimosi modelius ir jų įtaką organizacijos mokymuisi bei veiklai. Siūlomas empirinis modelis, kuris skirtas žinių kitimui analizuoti (Nonaka ir Takeuchi, 1995) ir kuris padeda tirti bendrą šių kintamųjų poveikį kompanijos darbui.

Tyrimo objektas – santykis tarp žinių kūrimo modelio ir organizacijos mokymosi.

Tyrimo metodas. Straipsnis parengtas remiantis teorine literatūros apžvalga apie žinių modelio kūrimą ir organizacijos mokymąsi bei apie struktūrinių lygčių modelį apskaičiuojant tiesioginį ir netiesioginį santykį tarp tiriamųjų objektų.

Nagrinėjant 284 Ispanijos kompanijų pavyzdžius, autorių pasiūlytas modelis šiai priklausomybei analizuoti. Rezultatai parodė: 1) teigiamą santykį tarp žinių kūrimo pobūdžio. Rezultatai parodo aiškia priklausomybę tarp įvairių žinių kitimo formų. Nonaka ir Takeuchi (1995) pasiūlė keturias neapibrėžtas ir aiškiai išreikštas žinias iš keturių žinių kitimo formų; 2) žinių kūrimas veikia organizacijos mokymąsi kaip svarbią žinių vadybos dalį (García ir kt., 2007; García ir kt., 2009). Analizė parodė, kad žinių kūrimas veikia organizacijos narių mokymosi procesus; 3) žinių kūrimas ir organizacijos mokymasis sukuria kitą požiūrį į nuolatinį gerinimą visos organizacijos veiklos (Senge, 1990; Peters, 1992). Šitas neapčiuopiamas turtas leidžia firmai didinti jos veiklos kokybę ir kiekybę ir siekti konkurencinio pranašumo.

Raktažodžiai: *žinių valdymas, žinių kūrimas, organizacijos mokymasis, organizacijos veikla, modelis.*

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