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THE EFFECTS OF TRANSACTIVE MEMORY SYSTEMS, COLLECTIVE MIND AND INNOVATIVE CULTURE ON KNOWLEDGE CREATION CAPABILITY

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ABSTRACT

Circumstances that changes in time require firms to have different skills in order to survive and acquire competitive advantages. Today's intensive knowledge environment makes knowledge transfer and integration to create new knowledge crucial to be able to obtain valuable knowledge. In this study, factors that affect knowledge creation capability that are important for firms are discussed. Within this context, transactive memory systems, collective mind and innovative culture variables are studied as the antecedents of knowledge creation capability. According to the study conducted with 267 firms operating in software sector at the technology development sites in Istanbul and Ankara, empirical results demonstrate that transactive memory systems, collective mind and innovative culture variables do have positive effects on knowledge creation capability.

Keywords: *Knowledge Creation Capability, Transactive Memory Systems, Collective Mind, Innovative Culture*

JEL Codes: *M14, M15*

GEÇİŞGEN HAFIZA SİSTEMLERİ KOLEKTİF ZİHİN VE YENİLİKÇİ KÜLTÜRÜN YENİ BİLGİ ÜRETME KABİLİYETİNE ETKİSİ

ÖZ

Zaman içerisinde değişen koşullar, işletmelerin hayatta kalması ve rekabet avantajı kazanması için farklı becerilere sahip olmasını gerektirmektedir. Günümüzdeki yoğun bilgi ortamı, değerli bilgiye ulaşabilmek için bireylerin sahip olduğu bilgileri aktarabilmeyi ve birleştirebilmeyi ve böylece yeni bilgi üretebilmeyi gerekli kılmaktadır. Bu çalışmada işletmeler için önemli olan yeni bilgi üretme kabiliyetini etkileyen hususlar ele alınmıştır. Bu çerçevede geçişken hafıza sistemleri, kolektif zihin ve yenilikçi kültür değişkenleri yeni bilgi üretme kabiliyetinin öncülleri olarak incelenmiştir. İstanbul ve Ankara illerindeki teknoloji geliştirme bölgelerinde yazılım sektöründe faaliyet gösteren 267 işletme üzerinde yapılan araştırma sonuçlarına göre geçişken hafıza sistemleri, kolektif zihin ve yenilikçi kültürün yeni bilgi üretme kabiliyeti üzerinde pozitif yönlü bir etkisinin olduğu bulunmuştur.

Anahtar Kelimeler: *Yeni Bilgi Üretme Kabiliyeti, Geçişken Hafıza Sistemleri, Kolektif Zihin, Yenilikçi Kültür*

JEL Kodları: *M14, M15*

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1. INTRODUCTION

Knowledge is the most important source for firms (Nag and Gioia, 2012). Firms are able to make innovations by creating new knowledge (Nonaka and Toyama, 2005; Nonaka and von Krogh, 2009; Von Krogh, Nonaka, and Aben, 2001), and managing different knowledge sources (knowledge inside individual, group and knowledge systems) within the organization to have a long-term success (Yanadori and Cui, 2013). Moreover, the knowledge shared between the employees and newly obtained knowledge form a basis for effective process innovation (Song, Kolb, Lee, and Kim, 2012), which enable firm to gain competitive advantage.

According to the "*Dynamic Capabilities Theory*", the firm's capability to integrate, build and reconfigure internal and external competences to address rapidly changing environments is an essential for firms to gain competitive advantage (Eisenhardt and Martin, 2000; Teece, Pisano, and Shuen, 1997; C. L. Wang and Ahmed, 2007). To use knowledge sources in line with the objectives of the firm (Eisenhardt and Martin, 2000; Grant, 1996; Kogut and Zander, 1992) and the new knowledge creation capability (Mitchell and Nicholas, 2006a; Smith, Collins, and Clark, 2005; D. Wang, Su, and Yang, 2011) are of great importance especially in a knowledge-intensive economy.

Today knowledge multiplies and spreads more rapidly than ever before. The new technological advancements make access to knowledge easier by accelerating the spread of knowledge. Thus, most firms can access similar knowledge sources and operate by using these sources. However, in order to help firms gain competitive advantage, these sources need to be "valuable, rare, inimitable and non-substitutable" (Barney, 1991). What makes all the difference for firms is to have the capability of knowledge creation capability which will make them gain competitive advantage by using existing knowledge. Knowledge creation capability is the ability of an organization to combining and exchanging the existing knowledge to acquire new knowledge (Smith et al., 2005). In order to creat new knowledge, there should be existing accumulation of knowledge (Cohen and Levinthal, 1990).

The importance of a knowledge creation capability increased the interest to the subject. When the related literature is reviewed, the capability to create is approached in both theoretical (Fong, Hills, and Hayles, 2007; Mitchell and Boyle, 2010; Mitchell and Nicholas, 2006b) and empirical studies (Heinrichs and Lim, 2005; Mitchell and Nicholas, 2006a; Smith et al., 2005; Tseng and Pai, 2014; Zelaya-Zamora and Senoo, 2013). However, there are few studies on the antecedent of the capability to create knowledge (D. Wang et al., 2011). The complex and

comprehensive of the process of knowledge creation increases the importance of the priorities of this skill.

In this study, the effects of transactive memory system, collective mind and innovative culture variable on the knowledge creation capability are examined. Within this scope, firms operating in software sector in technology development areas, where knowledge creation capability processes are intensive, are selected as the sample of the study.

2. THEORETICAL FRAMEWORK

2.1. Knowledge Creation Capability

With the rapid advance of science and technology, and the fact that new information is produced at every moment affects the competitive situation of the firms. In order to create and sustain a competitive advantage, they must create new knowledge accumulation continuously with their knowledge creation capability (Su, Ahlstrom, Li, and Cheng, 2013: 475). The new knowledge that firm creates internally makes it difficult for its rivals to imitate by offering new ideas, skills and methods to facilitate organizational goals (Nonaka and von Krogh, 2009; Nonaka, Von Krogh, and Voelpel, 2006).

Smith, Collins, and Clark (2005) define knowledge creation capability as organization members' ability to combine and exchange the existing knowledge to acquire new knowledge. Organizational knowledge is examined as explicit and tacit. Explicit knowledge contains knowledge that is code-designated and easy to exchange and understand. Tacit knowledge, on the other hand, is composed of knowledge that are owned by individuals, and cannot be directly perceived and verified (Nonaka and von Krogh, 2009). Knowledge creation capability is of great importance to reveal the valuable knowledge that individuals have in line with the organization's objectives and new knowledge creation. Because new knowledge creation is the basis of organization's success and sustainability in an intense competition environment (Kogut and Zander, 1992; Mitchell and Nicholas, 2006b).

Knowledge creation is related to the social relations between the individuals who have the certain expertise in their fields inside the organization (Smith et al., 2005: 348-349). The dependency of organizations in knowledge is growing. To produce a single product or offer a certain service, knowledge must be integrated to various disciplines and borders. This situation increases the need for organizations or teams to exchange and create new knowledge within the firm borders (Fong, Hills, and Hayles, 2007: 41). Thanks to the existing social networks, members of the network are informed about existence, place and importance of the knowledge

hence a smoother knowledge exchange takes place (Smith et al., 2005: 348-349). The processes that enables the integration of different knowledge areas makes knowledge creation easier. There are findings that the roles related to linking one knowledge area to the other help organizations transform existing knowledge into innovations by enabling border-crossing knowledge exchange (Tseng and Pai, 2014) and make innovation process easier (Mitchell and Nicholas, 2006).

Effective knowledge creation depends on the interactions of the relationship between groups and facilitated group processes (Mitchell and Nicholas, 2006b:312). Accumulation of knowledge is the most important part of this process. Hiring and training well-educated employees with different functional expertise increases the chances of these employees brainstorming to create and exchange new knowledge (Smith et al., 2005). Besides, new ways can be created to coordinate external knowledge and integrate external and internal knowledge during the process (Su et al., 2013:476). Social relations also affect the knowledge creation capability. Organizational culture has strategic importance for knowledge creation capability. An atmosphere that encourages to take risks boosts the capability of knowledge creation. Team work and collective action are considered necessary for knowledge creation (Smith et al., 2005).

2.2. Transactive Memory Systems

The first point of transactive memory systems is a search for method that shows how individuals can expand their memories with the help of external sources such as books, events or group members (Ren and Argote, 2011). Wegner, Giuliano and Hertel (1985), who present the concept for the first time, define transactive memory systems as communication that takes place among individuals along with the individual memory systems cluster. Researchers identify two components of transactive memory systems and define them as (1) organized knowledge in the individual memory systems of the group members and (2) a series of transactive process between group members (Wegner et al.,1985: 256). Another commonly used definition for transactive memory system is a shared system developed by the individuals in a relationship to encode, store and retrieve different knowledge domains (Ren and Argote, 2011: 191).

Transactive memory systems are a group characteristic rather than individual. However, it is not possible to see where this system is just by observing the individual. Because this system occurs as a result of personal efforts of the individuals working as a group mind (Wegner, 1987:191). Individuals in groups with transactive memory system very well know the

existing knowledge and abilities for each member. This makes access easier for both knowledge and coordination (Mitchell and Nicholas, 2006a).

Known experts in a domain are responsible for encoding, storing and retrieving the new knowledge acquired in this domain. Other group members contribute to the centralization of this knowledge by offering new knowledge to the right expert (Wegner, 1987: 192). Centralization of knowledge is about knowing where and whom the knowledge is with when it is needed. Hence, integration plays a significant role for the effectiveness of transactive memory system.

Transactive memory systems is an important factor that positively affects a group's capability of knowledge creation (Cao and Ali, 2018). Researchers indicate that transactive memory system has a capacity to ease the knowledge integration between group members which is an important element of knowledge creation (Mitchell and Nicholas, 2006a).

Transactive memory systems can improve a group's capability of knowledge creation by enabling easy access to the existing knowledge sources inside the group. Transactive memory systems, as it was mentioned above, is composed of encoding, storage and retrieval phases. During the encoding phase, group members acquire the knowledge of "who knows what" inside the group. This knowledge makes the knowledge exchange mechanism between the group members take place smoothly (Cao and Ali, 2018: 73). The significance of encoding emerges when it comes to understanding the knowledge offered to the group properly and where it should be placed according to the area of expertise (Mitchell and Nicholas, 2006a). Transactive memory systems improve group's capability of knowledge creation, especially by comprehending the term "who knows" in the group, processing, combining and exchanging the existing individual knowledge with the other group members (Cao and Ali, 2018).

The knowledge creation capability is based on the exchange of knowledge between team members in a safe and effective way. Mitchell and Nicholas (2006a) state that lack of transactive memory system negatively affects knowledge exchange and there is a casual link between transactive memory systems and knowledge creation capability. Therefore, it can be said that transactive memory systems enables a developed team to exchange knowledge efficiently, improving the knowledge creation capability.

H_1: *Transactive memory systems positively affect knowledge creation capability.*

2.3. Collective Mind

The concept of collective mind introduced by Weick and Roberts (1993) explains how individual members of a group act to create an operational safety in complicated and changeable task environments. The concept was then used in other areas that require group work (Akgün, Byrne, Keskin, and Lynn, 2006; Cabeza-Pullés, Gutierrez-Gutierrez, and Lloréns-Montes, 2015; Huang, 2009).

Collective mind acts as a bridge to transfer the cognitive structures of individuals with tacit knowledge to the team level. Collective mind is formed when affiliated people complete a single mind with differentiated responsibilities in order to remember different parts of a common experience. A sophisticated collective mind is concluded with the coordination of actions, mutual respect and confidence. The critical dynamic for the formation and use of a collective mind is the interpersonal interaction. Weick and Roberts, (1993) define these interactions as representation, subordination and contribution. Representation is the individuals 'ability to present themselves, their truths and arguments to the rest of the team. Subordination is an individual's ability to acknowledge the authority or control of another (Brockmann and Anthony, 1998: 209-210). Contribution means actions are constituted and practiced by the actors inside the system. With a collective mind, people pay attention to contributed, represented and underlying behaviors that result in conclusions at a system level (Hsu, Liang, Wu, Klein, and Jiang, 2011: 515-516).

Collective mind is a social process which produces as series of individual interactions coordinated by group members (Cabeza-Pullés et al., 2015). When group members link their actions to each other carefully, collective mind comes into being (Akgün, Byrne, Keskin, and Lynn, 2006: 99). When collective mind is formed in a group, members can create common actions and responsibilities for their group duties and encourage teach other to act as a consistent group in order to fulfill their group duties (Huang, 2009). Collective action that is generated also increases the effectiveness of knowledge creation activities.

H_2: *Collective mind positively affects knowledge creation capability.*

2.4. Innovative Culture

Smith et al. (2005) stated that organizational routines are critical priorities of an institution's knowledge creation capabilities. The success of knowledge creation activities is possible with adaptation and practice of organizational implementation by individuals. The

subject of culture is among the most important factors that affect individuals' adaptation to organizational activities (O'Reilly III, Chatman, and Caldwell, 1991).

Culture with the shortest definition, refers to the values and beliefs shared by employees at all levels and the characteristics of the organization. It summaries the impressive characteristics of the employees. Culture is transmitted and strengthened through symbols, emotions, relationships, language, behaviors, physical arrangements and so on (Dobni, 2008: 544).

Innovative culture includes innovation, development and new sources. Moreover, flexibility, creativity, risk taking, and entrepreneurship are values supported by innovative culture. Organizational and managerial support are important factors for the creation of innovative culture (Cramm et al., 2013: 123). Innovative culture facilitates collaboration for gathering the necessary knowledge and sources for implementation. It helps new ideas to be accepted. It makes comprehensive internal and external communication easier (Hurley and Hult, 1998).

Organizational routines have an important effect on knowledge creation capability. Because these routines create an environment that unofficially and tacitly defines how a firm develops and uses knowledge. Hence, organizational culture, which is an important element of organizational routines have a significant effect on knowledge creation capability (D. Wang et al., 2011: 364).

Innovative culture reduces fear, increases open-mindedness and encourages risk-taking among employees (Hurley and Hult ,1998). Open-mindedness is individuals' beliefs on how they receive other people's opinions and knowledge. Open-mindedness includes the belief of other people need to be free in order to express their opinions and other people's knowledge must to be recognized. Conscious interaction has a critical importance for knowledge creation efforts and open-mindedness norms increase the possibility of new knowledge creation in groups (Mitchell and Nicholas, 2006a).

In order to create new knowledge, all kinds of positive and negative knowledge and experiences must to be shared. Knowledge creation is extremely important for the creation of new solutions or solutions for existing problems (Fong et al., 2007). Organizational culture, especially innovative organizational culture, improves internal abilities that encourage open-mindedness for new ideas and adaptation of new ideas, processes or products successfully (Hurley and Hult, 1998; O'Cass and Ngo, 2007). In this matter, innovative culture plays a

critical role in knowledge creation capability (D. Wang et al., 2011). The hypothesis that is developed within the scope of these evaluations is:

H₃: *Innovative culture affects knowledge creation capability.*

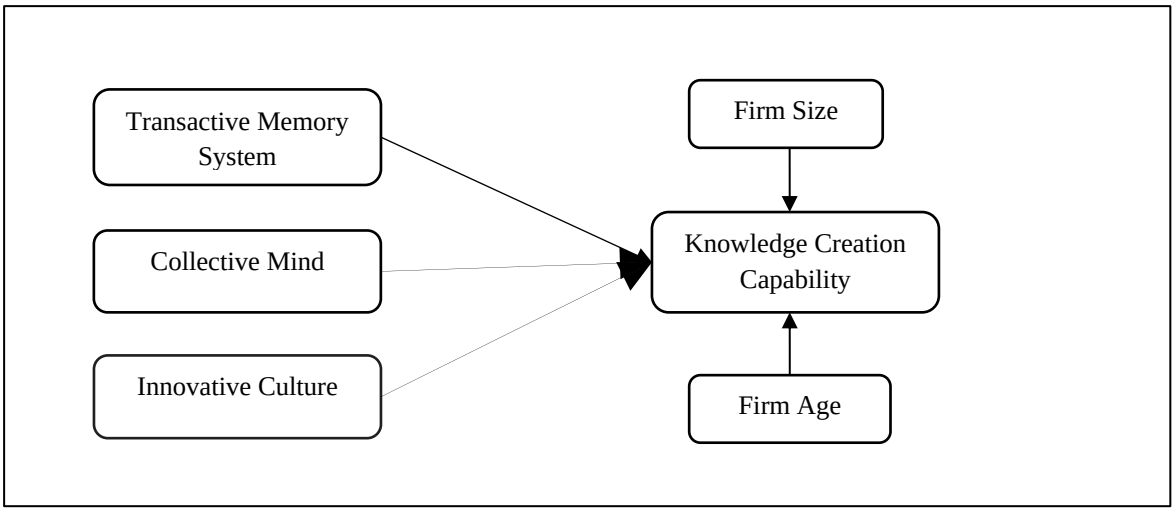

Figure 1. Proposed Research Model

3. METHODS

3.1. Sample and Data Collection

The data in this study was obtained by means of the survey study tool. Multi-item scales from previous studies were used to measure structures. All structures are measured using 5-point Likert scales ranging from "strongly disagree" to "strongly agree." The scales used in the study are translated into Turkish via parallel translation. The congruity of the Turkish version of the questionnaire are examined to three different academicians working at the field. After making the necessary arrangements, the data is gathered with the latest version of the scale via mail.

Information and software firms operating in the technology development centers in Ankara and Istanbul are selected as samples. The reason behind this selection is that almost half of the active technology development centers in Turkey operate in these cities. Moreover, the high level of development of the information and software sector has been effective in the selection of these sectors.

Among the firms listed on the websites of the official institutions, 1,000 firms were randomly selected, and a questionnaire was sent by e-mail. 267 of the firms who were sent the questionnaire returned to the mail 26,7%).

3.2. Variables and Scales

The measures of knowledge creation capability were composed of 12 items developed Su et al., (2013). Items on transactive memory systems and collective mind are adapted from the work by Yoo and Kanawattanachai (2001). Transactive memory systems are evaluated with three items while collective mind is with four. On the other hand, innovative culture is adapted from the work by Terziovski (2010) and it is measured with six items.

The age of the firm is taken as the first control variable. The firms are categorized according to the operating year (1=5 years and less, 5: 20 years and more). 29% of the firms have been operating for 5 years and less, 53% have been operating for 6 to 10 years, 13% for 11 to 15 years, 3% for 16 to 20 years and 2% has been operating for 21 years. The number of employees of the firms is used as the second control variable of the study. 8% of the firms employ 1 to 5 people, 55% employ 6 to 10 people, 35% employ 11 to 20 people and 2% employ 21 people and more.

3.3. Reliability and Validity

Cronbach's alpha value of all multi-item factors is above point 0.70, suggesting that their theoretical constructs have good composite reliability. All loadings are above 0.70 with only one exception (0.684); thus, all items show good construct validity (Fornell and Larcker, 1981). Confirmatory factor analyses (CFA) for each set of constructs were taken to further test the composite reliability (CR) and construct validity. The CR for each construct exceeds the 0.70 at 0.713 or higher. Moreover, the estimation of the average variance extracted (AVE) is 0.534 or higher than .50 (Bagozzi and Yi 1988). Thus, both CR and convergent validity are supported by the CFA results (Table 1).

Discriminant validity is assessed by running chi-squared difference tests for all multi-item constructs in pairs to see if they are distinct from one another. The process involves collapsing each pair of constructs into a single model and comparing its fit with that of a two-construct model (Anderson and Gerbing, 1988). The second item of the innovative culture variable is excluded from the study due to low factor loading. The results of pairwise tests indicate that in each case the difference in chi-square value is significant, providing evidence to discriminant validity. And the results of a varimax rotated component matrix in Table 1 indicate that all variables differ from each other. Thus, the measures show good discriminant validity.

Table 1. Measurements and The Rotated Component Matrix

Variables	Components			
	1	2	3	4
Knowledge Creation Capability (Alpha = 0.919; CR = 0.931; AVE = 0.554)				
KCC1	**,781**	,043	,109	,047
KCC 12	**,755**	,070	,027	-,002
KCC 2	**,750**	,026	,016	,009
KCC 5	**,743**	,047	,050	,031
KCC 6	**,722**	,077	,079	,046
KCC 10	**,717**	-,060	,039	,077
KCC 9	**,712**	,012	-,003	-,020
KCC 11	**,711**	,100	,068	,055
KCC 7	**,705**	,091	,074	,030
KCC 4	**,704**	,048	,045	,057
KCC 8	**,703**	,033	-,055	-,016
KCC 3	**,684**	,120	-,027	,047
Innovative Culture (Alpha = 0.852; CR = 0.891; AVE = 0.622)				
IC 5	,123	**,845**	-,007	,014
IC 1	,083	**,802**	-,008	-,012
IC 6	,087	**,796**	-,075	-,043
IC 3	,047	**,764**	,013	,034
IC 4	,023	**,731**	,098	,116
Collective Mind (Alpha = 0.823; CR = 0.878; AVE = 0.643)				
CM 3	,085	,028	**,831**	,055
CM 2	,051	,009	**,817**	-,090
CM 4	,076	-,059	**,783**	,025
CM 1	,019	,051	**,774**	-,209
Transactive Memory System (Alpha = 0.713; CR = 0.831; AVE = 0.622)				
TMS 2	,092	-,032	-,101	**,865**
TMS 1	,040	,036	,038	**,769**
TMS 3	,051	,084	-,122	**,725**
Eigenvalue	6,611	3,036	2,712	1,789
% of variance	26,49	13,251	11,045	8,162
Cumulative % of variance	26,49	39,74	50,79	58,95

3.4. Results

The means, standard deviations, and correlations between the research variables are presented in Table 2. It shows that the correlation between knowledge creation capability and control variables is not significant (Firm age, r = 0.012, p > 0.05; Firm size, r = -0.050, p > 0.05). In following Stine (1995), multicollinearity is checked by computing the variance

inflation factors (VIF) of the variables. The VIF values ranged between 1.03 and 1.98, indicates that multicollinearity is not a problem (Kalaycı, 2010:225).

Table 2. Descriptive Statistics and Correlations

	1	2	3	4	5	6
Knowledge Creation Capability	1					
Transactive Memory System	,187**					
Collective Mind	,335**	-,168**				
Innovative Culture	,208**	,059	,100*			
Firm Age	,012	,050	-,040	-,002		
Firm Size	-,050	,006	-,056	-,027	,328**	
Mean	4,4310	4,4768	4,4291	4,4128	9,74	11,0734
Standard Deviation	,12318	,26019	,21243	,38573	3,993	14,83117

*p<,1, **p<,05, ***p<,01

Table 3: Results of Regression Analysis

	Model 1	Model 2	Model 3
Firm Age	,022	,028	,027
Firm Size	-,059	-,040	-,036
Transactive Memory System	,186***	,249***	,237***
Collective Mind		,375***	,358***
Innovative Culture			,157***
R-square	0,038	0,175	0,199
Adjusted R-square	0,033	0,168	0,191
F-value	6,789***	27,131***	25,421***
Durbin Watson	1,726	1,865	1,914

Dependent Variable: Knowledge Creation Capability *p<,1, **p<,05, ***p<,01

Models 1 to 3 in Table 3 present results from hierarchical regression analyses performed to test study hypotheses. Model 1 control variables along with transactive memory system variables are entered in the regression model. It is found that firm age and firm size are not significantly related to knowledge creation capability ($\beta = 0.022$, $p > 0.05$; $\beta = -0.059$, $p > 0.05$). Only transactive memory system is a significant predictor ($\beta = .186$, $p < .01$). The full model is statistically significant ($F= 6,789$ $p < .001$) and explained an adjusted 0,3 % of variance in knowledge creation capability. Hence, there is support for Hypothesis 1.

In model 2, collective mind is entered in the regression model. Model 2 shows a significant relationship of collective mind and knowledge creation capability ($\beta = .375$, $p < .01$). The full model is statistically significant ($F= 27{,}131$ $p < .001$) and explained an adjusted 16 % of variance in knowledge creation capability. So, Hypothesis 2 is supported.

Finally, in model 3, innovative culture is entered in the regression model. According to model 3, innovative culture is a significant predictor ($\beta = .157$, $p < .01$) and the full model is statistically significant ($F= 25{,}421$ $p < .001$) and explained an adjusted 19 % of variance in knowledge creation capability. As the results show, Hypothesis 3 is supported.

4. CONCLUSION

Knowledge creation is one of the issues that are given importance by all organizations as it helps gain organizational competitive advantage (Kogut and Zander, 1992; Nonaka et al., 2006; Spender, 1994; Tsoukas, 1996). This study offers different contributions to knowledge management area by defining the important antecedents of knowledge creation capability. Studying antecedents of knowledge creation capability not only facilitates firms' awareness on knowledge creation but also improves the process of knowledge creation (D. Wang vd., 2011). Within this scope, transactive memory systems, collective mind and innovative culture are studied as the antecedents of knowledge creation capability.

According to the results of the research conducted on firms operating in software sector, it is discovered that transactive memory systems have effects on knowledge creation capability. When individuals working in the organization have close relations, they develop transactive memory systems, knowing who is expert on what. Transactive memory systems provide convenience to the individuals while revealing and distributing tacit knowledge (Akgün et al., 2006; Choi, Lee, and Yoo, 2010; Li and Huang, 2013). Thus, new knowledge creation inside the organization becomes easier. The results of the survey support the work by Mitchell and Nicholas (2006a) and Cao and Ali (2018).

When the effects of collective mind on knowledge creation process are analyzed, it is determined that collective mind positively and significantly affects knowledge creation capability. The collective mind emerges when group members carefully connect their actions to each other (Akgün et al., 2006). When collective mind grows in a group, members can develop common actions and responsibilities in order to reach their target (Huang, 2009). Having a sense of responsibility shared by all organization members while creation of new knowledge increases knowledge creation capability.

The last factor that is taken into consideration in this study is innovative culture. Innovative culture has a positive effect on knowledge creation capability. Organization with innovative culture give great importance to make use of all opportunities to try new ideas and put out new products (Ireland, Kuratko, and Morris, 2006; Wei, O'Neill, Lee, and Zhou, 2013). Culture has an important contribution to individuals to serve organizational objectives by affecting individual's ideas, emotions and actions (Pettigrew, 1979).

Mitchell and Nicholas (2006a) state that knowledge creation process consists of accumulation, interaction, analysis, integration and production. However, for this process to be carried out in an effective way, there is need for knowledge creation capability (Smith et al., 2005). Cultural features especially have a critical importance for this capability to improve and spread along the organization (D. Wang et al., 2011). This situation is more important especially in sectors where interaction and knowledge sharing are significant.

According to the result of the research, transactive memory systems, collective mind and innovative culture positively affect knowledge creation capability. Today, when access to knowledge is so easy, the most important thing for firms is to create knowledge that is different, valuable and hard to imitate by using the existing knowledge. Creation of such knowledge first depends on individuals working in the organization and then the management that is in charge of building the environment which enables individuals to use their knowledge. A working environment where people have healthy communications with innovative culture, express their opinions openly and share their knowledge in an effective way in confidence contributes creation of new ideas.

The study has some limitations. Firstly, the study was conducted through firms operating only in software sector. Findings obtained from different sectors might give different results. Secondly, the data were obtained via survey. Constraints of the method of survey were applied to this study as well.

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