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# **Knowledge processes and firm performance: the mediating effect of employee creativity**

## **Purpose**

In the current era, firms are facing difficulties in aligning their capabilities with the hallmarks of the knowledge intensive economy. Notwithstanding the fact that employees' creativity ensures competitive advantage through innovation, firms are unable to reap the required level of performance. This study investigates the linkage among knowledge processes, employee creativity and firm performance. Moreover, the current quantitative inquiry measures the moderating effect of knowledge intensive culture on knowledge processes and employee creativity.

## **Methodology**

Surveys were conducted in eight services sector organizations operating in southern Punjab, Pakistan and responses were obtained from 197 employees selected at random. To test the exposition using empirical data analysis approach, three core hypotheses are drawn and multiple regression analyses, Preacher and Hayes (2004) mediation test and Aguinis (2004) guidelines for moderation were applied on 197 responses to test these hypotheses.

## **Results**

The results explain that knowledge processes have a positive impact on firm performance and employee creativity partially mediates their stated relationship. Moreover, knowledge intensive culture has a strengthening effect in the relationship between knowledge processes and employee creativity. In-depth investigation outlines that knowledge acquisition, sharing and application are more influencing processes to enhance firm performance. Furthermore, knowledge conversion and protection do not hold significant relevance with firm performance but are supportive elements for other processes.

## **Implications**

To mature sustained performance, firms have to initiate steps to promote employees' creativity by deploying optimal mix of knowledge processes and flourish knowledge intensive culture in routine organizational life. Moreover, knowledge processes are important to promote creative behavior in employees that will lead to incessant innovation and firm performance.

## **Originality/value**

This study gives meaningful thoughts to unexplored areas in the field of knowledge management. First, the indirect effect of knowledge processes on firm performance through employees' creativity. Second, the importance of knowledge processes to enhance employees' creativity in the presence of knowledge intensive culture. This study gets together the dynamic constructs in the field of knowledge management; such as knowledge intensive culture and employee creativity and describes their linkage between knowledge processes and firm performance.

**Keywords:** Knowledge Processes, Employee Creativity, Knowledge Intensive Culture, Firm Performance

## **Introduction**

Competence-based -view (CBV) explains the importance of employees' knowledge to enhance firm level performance in a knowledge-driven-economy (Camisón, 2004; Chen et al., 2016). Since inception, globalization exerts pressure for raising optimal performance to remain competitive in the industry for service and manufacturing sector (Lu & Beamish, 2004). With the emergence of knowledge management discipline, the firms enter into a new avenue to develop employee-level-competence and organization-level-capabilities. Lee and Sukoco (2007) presented knowledge perspective model and claimed that firm performance is the joint outcome of the tangible and intangible resources; intangible resources are termed as knowledge worker. Employees possess knowledge that is an important factor is knowledge that is used for organizational wellbeing i.e. problem solving, innovating new products, organizational effectiveness and performance (Chien & Tsai, 2012; Goh et al., 2012; Zaied, 2012). Knowledge management is important in all sectors, but in services sector organizations its role is paramount. Employees are the center of attention as their services matter for organizational reputation and profitability and knowledge management is found to be one of the prime success factor in service context (Farzin et al., 2014). Hence, in 21<sup>st</sup> century, organizations are going to invest in their employees to enhance their competence level (Camisón, 2004). In Pakistan, service sector is an important pillar of economy that is growing and constitute around 50% share in overall

economy as per Ahmed and Ahsan (2011) making study of knowledge management as an antecedent of performance worthwhile.

Knowledge possessed by employees is found to result in more creative behaviors as Maimone and Sinclair (2014) highlight the importance knowledge creation to promote creative behaviors in employees. With the help of knowledge, employees are capable to generate innovative ideas and craft paths to implement those ideas (Vargas, 2015). Additionally, Oldham and Cummings (1996) argued that creative behavior of employees is necessary to raise employees' job and contextual outcomes as well as organizational performance (Anantamula, 2007; Rasula et al., 2012; Zaied et al., 2012). To strengthen knowledge and creativity relation conducive environment is required as employees need collaborative environment to perform tasks and knowledge intensive culture is an organizational infrastructural element that supports to encourage creativity in organizations (Hauschild et al., 2001). Knowledge intensive culture is one of the process that facilitates employee creativity: for example, in a knowledge supportive culture, employees are encouraged to share knowledge, gain new knowledge, convert it into useable form, apply in right direction and protect it from unlawful hands (Jones et al., 2005; Lal, 2002). In this context, organizations are keenly interested to develop processes that provide employees the required knowledge and influence its overall performance.

Recently, researchers have paid attention toward the outcomes of knowledge management as well as the factors facilitating knowledge and organizational outcomes relationship. Such as, Vargas (2015) argued that knowledge management promotes learning environment in organizations that is helpful to flourish creativity and innovation. Till date, various studies has been conducted to create link between knowledge management and firm performance (Ahn & Chang, 2004; Chang & Chuang, 2011; Chien & Tsai, 2012; Lee et al., 2012; Zaied et al., 2012). Yet the indirect effect of knowledge processes on firm performance remained an unattained area. Furthermore, earlier discussions on employees' creativity restricted to find-out its antecedents and possible effects on employee oriented outcomes i.e. intelligence, leadership, cognition, experience, insights, collaboration, feelings, thinking patterns and observation. (Hirst et al., 2009; Liu et al., 2012; Oldham & Cummings, 1996; Tierney et al., 1999; Unsworth et al., 2005; Zakaria et al., 2004; Zhou & George, 2003). Afterwards, with the emergence of knowledge management discipline, the firms enter into a new avenue to develop employee-level-

competence and organization-level-capabilities. Lee and Sukoco (2007) presented knowledge perspective model and claimed that firm performance is the joint outcome of the tangible and intangible resources: intangible resources are termed as knowledge worker. Lately, employee creativity has gained substantial responsiveness from the researchers' side due to its importance towards organizational outcomes i.e. innovation (Leonardi, 2014), effectiveness (Gold et al., 2001), reputation (Lee & Choi, 2003), competitive advantage (Argote & Ingram, 2000; Ndlela & Toit, 2001) and performance (Anantatmula, 2007; Rasula et al., 2012; Zaied et al., 2012). Thus, signaling further investigation for organizational related outcomes.

To fill the identified gap in literature and to provide insights into the underlying processes facilitating firm performance through knowledge management, this study aims to investigate the potential impact of knowledge processes on firm performance with mediating effect of employee creativity. Moreover, current study unpacks another unexplored area: the interactive effect of knowledge intensive culture between knowledge processes and employee creativity in service sector organizations in Pakistan. We propose, that the creative ideas of employees can sharpen time to complete task and solve existing and new problems. Therefore, services sector organizations are the context of this study. In this context, there are three main objectives of this study; first is to investigate the impact of knowledge processes on firm performance, second is to measure the indirect effect of knowledge processes on firm performance through employee creativity and last is to examine the moderating role of knowledge intensive culture in between knowledge processes and employee creativity.

## **Theoretical base and conceptual model**

### **Knowledge Management in services sector**

While trading and manufacturing sectors have more tangible resources, the services sector has only one resource: employees, that are regarded as knowledge workers (Drucker, 1999). Firestone and McElroy (2003) advocate that Knowledge Management (KM) effectiveness insures skilled employees to maintain customers' delight. Services sector is based on the transfer of knowledge from employees to customers about what organizations have for them as well as getting customers' demand & feedback for rethinking to produce better services. The academic and

professional scholars in the field of KM are addressing the organization-wide issues of tacit knowledge and how it can be transferred to others in tacit or explicit form (Desouza, 2003; Drucker, 1999; Nonaka, 1994; Cavusgil et al., 2003). Imran et al. (2016) highlighted the importance of KM in the financial sector to develop and organize learning in organizations. Further, Bose (2003) explained the same thoughts while studying KM in health care institutions. Likewise, contemporary literature has significant examples to climax the importance of KM in services sector organizations (Kridan & Goulding, 2006; Cranfield & Taylor, 2008; Curado, 2008; Guptill, 2005). Despite all of the above, it is not an easy task to implement KM systems in services sector because employees feel uncomfortable to share what they have unique to lose their position in the organization. Their behaviors are governed by two distinct theories; either to become “facilitator” or “separator”. When knowledge is regarded as a source of gaining competitiveness for organizations, employees follow “facilitator theory” and when knowledge is used for gaining power, then employees adhere to the principles of “separator theory” (Franco & Mariano, 2010). Maimone and Sinclair (2014) states that creative behaviors of employees is the outcome of knowledge they possess. This study is designed to address what the services sector needs to flourish knowledge among employees and to turn that knowledge to creativity.

### **Theoretical framework and hypotheses**

Knowledge is a complex and context specific construct. Davenport and Prusak (1998) defined knowledge as the optimal synthesis of contextual information, values, framed experience and expert insight to develop a holistic view of any phenomena. The concept of KM processes stems from dynamic theory of knowledge creation (Nonaka, 1994). KM processes deviates from the general perception of scholars about knowledge management; i.e. the art of managing large data using data structuring and mining (Alavi & Leidner, 2001; Hampel & Keil-Slawik, 2001; Shaw et al, 2001). Gold et al. (2001) argued that KM processes ensures effective creation, conversion, storage, application of knowledge within the boundaries of an organization. Extant literature is evident that KM processes have association with learning (Imran et al., 2016), innovation (Ju et al., 2006), problem solving (Starns & Odom, 2006), managerial effectiveness (Zheng et al., 2010), exchange of ideas (Desouza, 2003), conflict resolution (Mohammed & Angell, 2004) and performance (Bhatt, 2001; Cardinal et al., 2001; Gold et al., 2001; Imran et al., 2016; Kidwell et al., 2001). The dynamic knowledge processes include knowledge acquisition, knowledge

conversion, knowledge application, knowledge sharing and knowledge protection that are directly or indirectly associated with different performance outcomes (Chang & Chuang, 2011; Franco & Mariano, 2010; Jokar et al., 2012; Lee & Choi, 2003; Pinho et al., 2012). Firm performance can be defined in two ways; subjective and objective. Subjective firm performance is defined in terms of market share, overall clientage, product awareness, customers' loyalty and credible reputation in the market (Delaney & Huselid, 1996). On the other hand, objective performance is based on financial indicators of the firm i.e. return on asset, return of equity, price earnings ratio and earnings per share (Hantrakul et al., 2012; Huselid, 1995). Using the hybrid approach to firm performance, a mix of objective and subjective measurement revealed five factors to effectively access the firm performance: capital profitability, operational and financial efficiency, growth, competitive position and stakeholder satisfaction (Marqués & Simón, 2006).

This study is using hybrid approach to measure the firm performance with the help of knowledge processes. In services sector organizations, employees are performing the key role in performance with the help of knowledge they have (Zaied et al., 2012). Beside required knowledge, there are knowledge processes whose responsibility is provide such knowledge to employees (Gold et al., 2001). Contemporary literature suggests that knowledge processes can affect firm-level-performance by emphasizing intellectual capital (Rehman, et al., 2011), competitive advantage (Meihami & Meihami, 2014), innovation ability (Goh, 2005), product development (Smith et al., 2005), organizational effectiveness (Gupta, 1996), organizational learning (Chien & Tsai, 2012) and change implementation (Imran et al., 2016). Earlier research addresses the link of knowledge management and firm performance (Sharma et al., 2010; Zack et al., 2009; Zaied et al., 2012) but no such attempt is made to investigate the proposed relationship using a hybrid evaluation based on subjective and objective evaluations simultaneously. To examine the stated relationship, following hypothesis is drawn:

H<sub>1</sub>: Knowledge processes have direct and positive effect on firm performance.

The earlier studies on employee creativity present a variety of definitions. These definitions include creative concepts with respect to people, processes, technology and context (Cummings & Oldham, 1997; Persing, 1999; Tierney et al., 1999). Further, extant research emphasized innovative ideas, product and services development and processes to develop products and

services (Tierney & Farmer, 2004; Zhou & Shalley, 2003). The basis of employee creativity is based on two conditions; the novelty of a given idea and its usefulness to develop innovative products and services (Dewett, 2007). Research has highlighted the linkage between creativity and firm performance (Hirst et al., 2009). Further, creativity transmits effects of leadership, intelligence and motivation to generate job outcomes (Cheung & Wong, 2011; Dewett, 2007; Zhou & George, 2003). Creative knowledge of employees has dual effect: first towards employees' insight to perform better and second towards organization to generate innovation (Blomberg, 2014; Hirst et al., 2009). Using knowledge processes, employees are able to acquire, exchange and apply knowledge. Additionally, these processes ensure employees to generate novel ideas, apply these ideas to innovate efficient processes, hence lead to creativity at workplace (Dewett, 2007). Recently, Maimone and Sinclair (2014) sought to learn the connection between knowledge creation and employee creativity and described that a positive association exists between new knowledge creation and creative behavior of employees at workplace. Likewise, market-driven products and innovative solutions give firms to glow in the industry with better results (Gong et al., 2009). Hence, it is hypothesized that:

H<sub>2</sub>: Knowledge processes have an indirect effect on firm performance through employee creativity.

The one KM infrastructural dimension, that is, Knowledge Intensive Culture (KIC), is important for the development of knowledge processes, albeit it has different role to play based on the norms of the firm (i.e., firms where employees hoard knowledge and where they openly share knowledge). Knowledge intensive culture is a well-defined concept within the KM discipline that is the accumulated form of shared beliefs, norms, attitude and behaviors of employees at workplace (Muqadas et al., 2017). Gold et al., (2001) used organizational culture in the prospective to enhance organizational effectiveness. Cultural infrastructure promotes knowledge processes within an organizational paradigm (Imran et al., 2016). Existing literature described organizational culture as direct, transmitting and interactive effects of various organizational and employee-oriented job and performance outcomes (Alavi et al., 2005; Allameh et al., 2011; Imran et al., 2016; Jokar et al., 2012; Zheng et al., 2010). The reflections of knowledge culture can be observed in employees' cognition, group behaviors and corporate image (Alsam et al., 2016). Imran et al. (2016) presented the interactive role of knowledge culture in mobilizing



knowledge management processes capability. Therefore, we formularized the following hypothesis:

H<sub>3</sub>: Knowledge intensive culture has a strengthening effect in the relationship between knowledge processes and employee creativity

The figure 1 is depicting the hypothesized framework of the study which elaborates the direct effect on knowledge processes on firm performance, indirect effect of knowledge processes on firm performance through employee creativity and moderating effect of knowledge intensive culture on relationship between knowledge processes and employee creativity.

**Insert Figure 1 Here**

## **Research Methodology**

### **Research context and population**

Around the globe, the services sector is rapidly increasing its share of the overall economy. Likewise, a similar trend is observed in the developing nations like Pakistan. Human capital is the key element in promoting the services sector (Ahmed & Ahsan, 2011). Services sector organizations operating in southern Punjab, Pakistan are the context of the current study. In Pakistan, the services sector is classified in four major areas:

- Distributor services (transport, storage, wholesale, retail, hotel & restaurant)
- Producer services (financial institutions & insurance)
- Personal services (entertainment, recreation & dwelling)
- Social services (social communities, public administration, defense, education & health)

The full-time regular employees of the services sector organizations, as per the context, are included in the population framework. To determine knowledge processes, prevailing culture and creativity they are producing at workplace. The framework of the services sector organizations is more or less same all over the world but some indicators are well established in developed countries as compared to developing nations i.e. working environment, employee benefits, job protection rules, culture and hierarchal structure (Chughtai & Buckley, 2010).

## **Measures and instrument development**

To test the exposition of this study, two independent questionnaires were prepared. The first questionnaire contained the items of knowledge processes, knowledge intensive culture and employee creativity. The data from first questionnaire was obtained from the employees of the services sector. The second questionnaire was formed based on the subjective measurements of the objective constructs of firm performance; capital profitability, growth, operational & financial efficiency, stakeholder satisfaction and competitive position. The data about firm performance was obtained from the five-year annual reports of the respective organizations i.e. from 2011-2015. Questionnaire was opted as the instrument of the study due to its relevance with quantitative study and pluses in comparison with other data collection instruments i.e. cost effective, time efficient, better response rate, easy to circulate.

Majorly four constructs were involved; knowledge processes having five dimensions, knowledge intensive culture, employee creativity and firm performance with five dimensions. The questionnaires were formed on the basis of existing scales developed by Gold et al., (2001)&Connelly and Kelloway (2003), Tierney et al. (1999)and Marqués and Simón (2006) for knowledge processes & knowledge intensive culture, employee creativity and firm performance respectively. To ensure the effectiveness, reliability and validity of the instruments, the Delphi method was adopted; seven experts, two from academia and five from relevant industries (i.e. banking, insurance, health, education etc.) were collaborated three times with an interval of one week and discuss each item of every scale regarding its viability to be included or excluded in the questionnaire. Total 96 items were considered to form the questionnaires and presented in front of experts. After comprehensive discussion, two separate instruments are formed and using pilot survey on initial 50 responses, cronbach alpha and model fit indices are observed. The items falling below and above the acceptable ranges are excluded as per the criteria described byKline (2006) for model fit indices (see table 1 and 2). First questionnaire consists of 42 items that measures the responses about knowledge processes, knowledge intensive culture and employee creativity and second questionnaire that was about firm performance includes 24 items.

## **Sampling procedure and features**

To ensure the representation of each area, two organizations are selected at random from each area of the services sector. The data regarding the number of regular employees was obtained from the regional headquarters of the respective organizations. Cumulatively, 5463 full-time regular employees were reported by the human resource departments working within the jurisdiction of regional headquarters i.e. southern Punjab Pakistan. From the population frame of 5463 employees, the criteria described by Kline (2006) was used and 350 employees were at random using simple random sampling.

## **Results and Analysis**

The data was collected from the full-time regular employees of the services sector operating in southern Punjab, Pakistan. A well-organized data collection procedure (i.e. registered mail, email, reminder calls, interaction through telephone) was adopted to obtain the maximum number of responses about knowledge processes, knowledge intensive culture and employee creativity i.e. first questionnaire. Further, the data regarding firm performance was obtained from the last five year annual reports of the respective firms. Cumulatively, after rejecting the 17 incomplete responses having more than 30% missing values, 197 valid responses were used to conduct the final analysis. The gender composition of the respondents validated the dominance of males i.e. 143 males and 54 females. Most respondents fell between 1-10 years of experience and 26-35 years of age with an education profile of graduation.

### **Descriptive, correlation and reliability analysis**

The values of descriptive indicators elaborate a general positive trend as mean values of all constructs are above absolute mean value. Moreover, standard deviation value is near to and slightly above 1 that is ensuring the consistency of the data. The internal consistency of the items is consistent with the criteria laid down by George and Mallery (2003). The Cronbach (1951) values are between 0.7 to 0.9; these values validate the internal consistency of the scales used in the study. In table 1, the values of correlation coefficient represent a moderate strength of relationship between variables (Cohen et al., 2013).

### **Insert Table 1 Here**

## **Confirmatory factor analysis**

To ensure the validity of the instrument, confirmatory factor analysis was applied. The appropriateness of model is necessary for further analysis, this is confirmed with the help of confirmatory factor analysis (Hoyle, 1991). The guidelines of McArdle (1996) has been followed to execute the CFA because these are most appropriate to elaborate the aptness of the model and adjust the model fit indices according to the standards set by Kline (2006). The conceptual model of the current study has eight latent variables; Knowledge acquisition, conversion, sharing, application, protection, knowledge intensive culture, employee creativity and firm performance. The benchmarks defined by Byrne (2013) were used for setting the model fit indices of the current study. The results of model fit indices presented in table 2 are in acceptable ranges and confirming that items used to measure the constructs are reliable and valid to operationally define the constructs.

**Insert Table 2 Here**

## **Hypotheses testing**

### **Direct effect**

It was hypothesized that knowledge processes can have a positive effect on firm performance. To test this hypothesis, multiple regression analysis was executed and results are elaborated in table 3. Cumulatively, 43% variations were found in firm performance through knowledge processes having other elements as constant. In-depth analysis clarified that knowledge acquisition, sharing and application ( $\beta_{KAC}=0.59$ ,  $t=11.34$ ;  $\beta_{KSG}=0.63$ ,  $t=13.43$ ;  $\beta_{KAP}=0.45$ ,  $t=10.92$ ) has positive effect on firm performance but relationship among knowledge conversion, protection and firm performance was not supported. The overall model was significant at  $p<0.005$  possessing f-statistics 108.65.

**Insert Table 3 Here**

### **Mediating effect**

To check the indirect effect of knowledge processes on firm performance through employee creativity, Preacher and Hayes (2004) mediation analysis was conducted. The overall results signify that employee creativity partially mediates the relationship between knowledge processes and firm performance (see table 4). In path-A, results revealed that knowledge processes have a positive effect on employee creativity ( $\beta_{KAC}=0.632$ ,  $\beta_{KCN}=0.329$ ,  $\beta_{KSG}=0.612$ ,  $\beta_{KAP}=0.544$ ,  $\beta_{KPT}=0.324$ ). Further, results of path-B indicated that employee creativity has positive impact on firm performance ( $\beta=0.354$ ,  $\rho<0.001$ ). The results of path-C and -C' indicate that employee creativity transmits effects of knowledge processes to firm performance ( $\Delta\beta_{KAC}=0.121$ ,  $\Delta\beta_{KCN}=0.133$ ,  $\Delta\beta_{KSG}=0.045$ ,  $\Delta\beta_{KAP}=0.089$ ,  $\Delta\beta_{KPT}=0.160$ ). The overall models were significant, confirming the indirect effect of knowledge processes on firm performance through employee creativity ( $R^2_{KAC}=0.483$ ,  $\rho<0.001$ ;  $R^2_{KCN}=0.289$ ,  $\rho<0.05$ ;  $R^2_{KSG}=0.432$ ,  $\rho<0.001$ ;  $R^2_{KAP}=0.418$ ,  $\rho<0.001$ ;  $R^2_{KPT}=0.301$ ,  $\rho<0.05$ ). The results indicate that employee creativity is an important indicator of firm performance and can be attained with the help of knowledge processes.

### **Insert Table 4 Here**

#### **Moderating effect**

In  $H_3$ , it was hypothesized that knowledge intensive culture moderates the relationship between knowledge processes and employee creativity. Using the guidelines of Aguinis (2004), multiple moderated regression analysis was executed with Aiken et al. (1991) interaction term. Two comparative models are presented in table 5 for all moderation combinations. The first model measured the direct effects of independent variables (acquisition, conversion, sharing, application and protection) and moderating variable (knowledge intensive culture) on dependent variable (employee creativity) to check the viability of applying interaction term, afterwards the interaction effects have been applied to check the strength of moderating effect.

### **Insert Table 5 Here**

The results of comparative analysis showed that knowledge intensive culture has strengthened the relationship between knowledge processes and employee creativity ( $\Delta R^2_{KAC}=0.073$ ,  $\Delta R^2_{KCN}=0.010$ ,  $\Delta R^2_{KAP}=0.024$ ,  $\Delta R^2_{KSG}=0.012$ ,  $\Delta R^2_{KPT}=0.007$ ), these relationships have further been probe with the help of graphs (see figure 2). These graphs are explaining the interaction

effects of KIC in the relationship between knowledge processes and employee creativity. In figure 2, five interaction effects are displayed those were plotted at two levels as performed by Aiken et al. (1991) using low and high level interacting effect of moderator. For each level, plotted values are displaying the relationship between knowledge processes and employees' creativity for low and high level of knowledge intensive culture. The results clarify that the presence of high knowledge intensive culture extends creativity in employees using knowledge processes. Moreover, knowledge acquisition, knowledge sharing and knowledge application are more responsive to get the benefits of supporting culture towards creativity ( $\Delta R^2_{KAC}= 7.3\%$ ,  $\Delta R^2_{KAP}=2.4\%$ ,  $\Delta R^2_{KSG}=1.2\%$ ) as compared to knowledge conversion and knowledge protection ( $\Delta R^2_{KCN}=1\%$ ,  $\Delta R^2_{KPT}=0.7\%$ ).

**Insert Figures 2 Here (all figures with adjustable look)**

## Discussion

Recognizing the prominence of knowledge towards employees' oriented outcomes, researchers started the current study with a simple question to determine the indirect impact of knowledge processes on firm performance through employee creativity. Afterwards, researchers were also interested to investigate the direct impact of knowledge processes and firm performance, and the interactive effective of knowledge intensive culture on knowledge processes and employee creativity. The results revealed that acquisition, sharing and application of knowledge have direct positive impact on firm performance while conversion and protection of knowledge have no direct relationship with firm performance. The results were previously explored by Gold et al. (2001) and other researches in the context of knowledge management (Alavi et al., 2005; Rasula et al., 2012; Zaied et al., 2012). The dynamic theory of knowledge creation has witnessed that new knowledge creation is the outcome of mutual exchange of knowledge and affect firm performance by promoting innovation and competitive advantage (Andrews & Delahaye, 2000; Nonaka et al., 2001). The current study has contradictory results with respect to knowledge conversion and protection as contemporary literature has suggested that these types of knowledge processes have direct impact on firm performance (Emadzade et al., 2012; Hoffman et

al., 2005; Zaied et al., 2012; Zheng et al., 2010). The possible reasons behind contradiction in results may be context-oriented as previously such type of researches were conducted in manufacturing organizations and employee-oriented with respect to their behavioral intention regarding the importance of converting and protecting knowledge. Guptill (2005) studied the effects of knowledge management in health sector organizations and elaborated that employee turnover is a normal recourse of business. Moreover, knowledge protection is not a phenomenon that is prevailing in a dynamic environment (McManis, 2003). On the other hand, results are arguing that knowledge processes have indirect effect on firm performance through employee creativity. In this context, employee creativity has partially mediated the relationship between knowledge processes and firm performance. These results are very promising and supporting earlier research findings; the association of knowledge with creativity (Farmer et al., 2003; Hirst et al., 2009; Liu et al., 2012) and the linkage between employee creativity and firm performance (Cummings & Oldham, 1997). At the end, the interactive effective was investigated based on extant literature. The findings exposed that knowledge intensive culture strengthens the relationship between knowledge processes and firm performance. The intensiveness of knowledge culture in organizations promotes knowledge sharing, transfer and exchange (Lavis et al., 2003; Cavusgil et al., 2003). Imran et al. (2016) examined that interactive effect of supportive culture to mobilize the knowledge process to enhance the learning orientation in organizations.

The explanations of these results offer important prospects. First, effective knowledge acquisition and its purposeful application have resulted in better firm performance i.e. innovation (Leonardi, 2014), competitive advantage (Argote & Ingram, 2000; Ndlela & Toit, 2001), effectiveness (Gold et al., 2001). Second, knowledge sharing is a key to develop knowledge competence and plays a vital role in developing individual and firm level performance (Choi et al., 2010; Hsu, 2008; Wang & Wang, 2012). Third, knowledge processes lead to improve employee creativity. The possible ways are new knowledge giving insights to idea generation (McFadyen & Cannella, 2004), conversion making it easier to obtain the codified knowledge to solve a problem (Starns & Odom, 2006), sharing of knowledge to enhance employee socialization and application of knowledge for idea implementation (Liao & Wu, 2010; Srivastava et al., 2006) and knowledge protection for sustained performance levels (McManis,

2003; Norman, 2001). Fourth, ideas that have a chance to be implemented with existing organizational resources is the source of generating competitive advantage and leads to firm performance (Gong et al., 2009). Fifth, cultural supportiveness is vital to ensure that knowledge processes enhance employee learning orientation, creative behavior and idea generation capability (Gong et al., 2009; Hauschild et al., 2001).

## **Conclusion**

In a dynamic environment, knowledge is considered to be a strategic resource of an organization can be a matter of distinction for numerous firms. Due to the significant importance of organizational wellbeing, the knowledge management discipline revolves around creation, accumulation, sharing, application and protection of knowledge within the functional boundaries of the organization. Current turnover patterns of employees in the services sector influences firms to develop knowledge oriented systems that ensure continuous learning which ultimately advance employees' competence to fill the intellectual gap aroused due to high turnover ratio. In this context, firms are intended to introduce an organization-wide knowledge environment that supports employees to gaining new knowledge, converting it into useable form, sharing it with their colleagues, applying it in right direction and protecting it from unlawful hands. Conceivably, the most imperative outcome of this empirical investigation is the indication of the indirect impact of knowledge processes on firm performance via employee creativity. Moreover, the presence of a knowledge intensive culture ensures the strengthening effect of knowledge processes on employee creativity. In this way, current empirical investigation delivers three broad relationships (i.e. direct, indirect and moderating) among knowledge processes, knowledge intensive culture, employee creativity and firm performance that are useful in current times to enhance firm level performance in an effective way. This study concluded that employee creative behaviors are the outcome of the knowledge they have, and knowledge processes provide them methods to get the required knowledge. Further, employee creativity provides competitive advantage to organizations by promoting innovations that lead to sustained performance.

## **Research implications**



Developing and testing an empirical model to investigate the indirect effect of knowledge processes on firm performance was the purpose of the current study. Based on the theoretical grounds, employee creativity and knowledge intensive culture are proposed as mediator and moderator respectively in the model, which afterwards proved partial mediation and significant interactive effect. These findings of current investigation add existing literature in these ways: First, the findings support the expositions present in the dynamic theory of knowledge creation and theory of organizational learning; the individuals' knowledge is the key to success for organizations. The perception of individual-level-knowledge affects team performance and ultimately leads to firm performance. This study highlighted the importance of individual knowledge to raise the creative behaviors and learning orientation of employees. Firms that have continuous learning process and invest to enhance the intellectual growth of the employees will generate more innovative products, and improve firm performance. Second, the study gives an extension to the standing body of knowledge by tapering the research gap by exploring the impacts of knowledge processes in the services sector organizations which has been paid little attention from the researchers' side to date. Third, this paper presents employee creativity as a powerful resource for firms to develop competitive advantage. The transmitting effect of knowledge processes on employee creativity and employee creativity to firm performance gives valuable implications for firms; developing infrastructure that facilitates knowledge exchange among employee, providing opportunities to employees for knowledge accumulation that is used for novel idea generation. Fourth, this model emphasizes the presence of knowledge intensive culture can multiply the effects of knowledge processes on employee creativity. Knowledge processes have established a direct link with employee creativity while a knowledge supporting culture provides a strengthening effect to the existing relationship between knowledge processes and employee creativity.

Moreover, results of this study have also offered some valuable recommendations for practitioners as well. First, every organization is always interested in maintaining performance for survival and growth. In this way, results have highlighted the importance of knowledge processes and suggesting firms to channelize these processes to enrich their employees with creative ideas that ultimately lead to performance. So, the management has to initiate steps to develop efficient systems where employees are able to use knowledge processes and come up

with creative solutions. This informs the managers that mere creation of knowledge is not important for any organization, but the converting the knowledge in usable form is also of utmost importance. In addition, the individual creation and conversion of knowledge is of limited use unless it is shared among the organizational members. So management should create interactive forums and discussions, face to face and through technology on formal and informal basis to facilitate the process of sharing Knowledge. Proper systems should be in place and the opportunities should be given to employees to apply the knowledge in organizational processes and gain protection for it. Second, the strengthening effect of knowledge intensive culture has provided firms a new avenue to preserve the favorable combinations of knowledge processes and employees' creativity for performance. Keeping in view the importance of supporting culture, firms have to give such environment where employees can interact and share knowledge for organizational benefits. This research gives practical insights about the mediating role of employee creativity. It explains that attaining creativity is not an ultimate aim for any organization; rather, creativity is only of use when it translates into organizational performance. So, despite of only focusing on the process of knowledge creation, conversion, sharing, application and protection for generation of creative ideas in the presence of an encouraging environment; it is equally important to convert creative ideas into actions that reap higher performance.

### **Limitations and future directions**

The results of the present study must be treated with caution because of some inherent limitations. First, the focus of the research was confined to one sector with narrow geographical area i.e. services sector organizations that are currently operating in southern Punjab, Pakistan. While narrowing down the context helped researchers to attain the objectives of the research with substantial richness, this may create a generalizability issue as well. However, results can be generalized in the services sector organizations with short geographical boundaries operating in developing countries particularly where collectivism culture exists. Second, this empirical model, like other conceptual models used in cross-sectional studies, ignores many other variables that may impact employee creativity and firm performance i.e. intelligence, leadership and intellectual capability. Third, the results obtained from the first questionnaire about knowledge processes, knowledge intensive culture and employee creativity was based on self-reported

responses from the employees that may raise the issues of respondent bias or common method variance. However, researchers have attempted to minimize this variance by deploying two separate questionnaires for obtaining the data for the current study. Second questionnaire was longitudinal in nature and data was obtained from the five years annual reports of the selected organizations. Fourth, survey method was not able to obtain the true acuity of the respondents, which might have constrained the research from having a more comprehensive analysis of the relationships (Madsen et al., 2005). In future prospects, qualitative or mix method approach can be helpful to explain the thorough understanding of the phenomena. Finally, the differences among the ways organizations define the performance can be a limitation. Like for some organizations reducing the Turned Around Time (TAT) to deliver a service is considered as high performance indicator but others give importance to innovative products, factors like that were not controlled in this research and there is a probability that they have influenced the findings of this research. For future research, it is strongly recommended to consider micro level dimensions of performance distinctly to avoid such type of limitation.

This paper opens future avenues for researchers in the field of knowledge management. First, this was an attempt to develop and test an empirical model about the impact of knowledge processes on firm performance through employee creativity. Some of the hypothesized relationships remained non-significant in the current setting. In the future, these hypotheses, along with other, may be tested by including other variables in another context to validate the existing results and suggests new paradigms as well. Second, the current research ignored the group level creativity and outcomes with respect to knowledge processes. In the future, group level dynamics may be tested within this model to make it more comprehensive. Finally, to ensure the authentication of the results, longitudinal research can be conducted about knowledge processes and its potential direct or indirect link with different organizational outcomes i.e. innovation, competitive advantage and organizational effectiveness.

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**Table 1: Reliability, Descriptive Statistics and Correlation**

Constructs	Alpha	Mean	SD	1	2	3	4	5	6	7	8
Knowledge Acquisition	0.77	3.38	1.11	-							
Knowledge Conversion	0.82	3.37	1.08	0.43							
Knowledge Sharing	0.79	3.21	1.05	0.67	0.53						
Knowledge Application	0.78	3.08	1.14	0.63	0.58	0.75					
Knowledge Protection	0.79	2.64	0.89	0.54	0.66	0.56	0.63				
Knowledge Intensive Culture	0.83	3.11	0.97	0.72	0.57	0.61	0.53	0.69			
Employee Creativity	0.75	2.98	1.04	0.49	0.51	0.63	0.59	0.59	0.48		
Firm Performance	0.89	3.05	0.99	0.56	0.61	0.57	0.72	0.52	0.71	0.73	-

Note: 1% level of significance is set for getting values of correlation coefficient

**Table 2: Validity check through Confirmatory Factor Analysis**

Description	CMIN/df	AGFI	GFI	RMSEA	CFI	TLI
Preliminary indices	6.56	0.832	0.876	0.084	0.867	0.902
Model fit values indices	2.99	0.932	0.965	0.052	0.978	0.975

Note: The thresholds observed as- CMIN/df < 3.0, AGFI-GFI-CFI-TLI > 0.90, RMSEA < 0.080

**Table 3: Direct Effect through Multiple Regression Analysis**

Relationship	R <sup>2</sup>	Adjusted R <sup>2</sup>	f-value	$\beta$	t-value	$\rho$
Overall	0.43	0.41	108.65			***
KAC→FP				0.59	11.34	***
KCN→FP				0.13	2.39	0.121
KSG→FP				0.63	13.43	***
KAP→FP				0.45	10.92	***
KPT→FP				0.21	2.98	0.054

Notes: KAC=Knowledge Acquisition, KCN=Knowledge Conversion, KSG=Knowledge Sharing, KAP=Knowledge Application, KPT=Knowledge Protection, FP=Firm Performance, \*\*\*p<0.005

**Table 4: Indirect effect of Knowledge Processes on FP through EC**

Relationships	R <sup>2</sup>	Adj. R <sup>2</sup>	f-value	Path-A	Path-B	Path-C	Path-C'	$\rho$
KAC→EC→FP	0.483	0.471	107.65	0.632	0.354	0.544	0.423	***
KCN→EC→FP	0.289	0.269	54.38	0.329	0.354	0.344	0.211	0.064
KSG→EC→FP	0.432	0.419	106.77	0.612	0.354	0.521	0.476	***
KAP→EC→FP	0.418	0.392	102.98	0.544	0.354	0.487	0.398	***
KPT→EC→FP	0.301	0.288	59.98	0.324	0.354	0.332	0.172	0.043

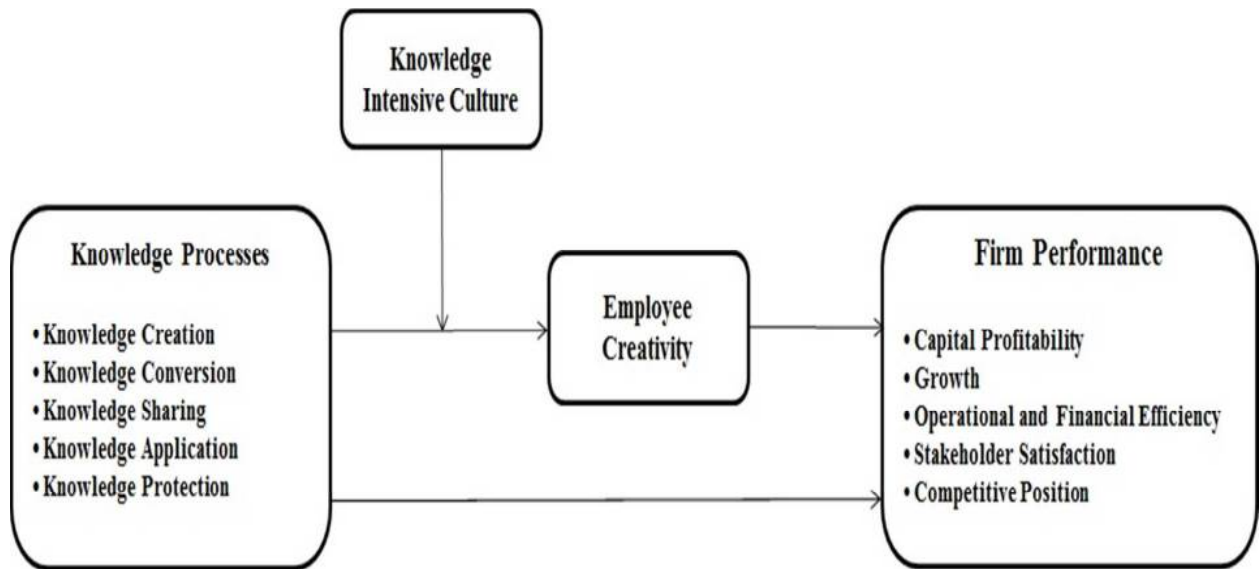
Notes: KAC=Knowledge Acquisition, KCN=Knowledge Conversion, KSG=Knowledge Sharing, KAP=Knowledge Application  
 KPT=Knowledge Protection, EC=Employee Creativity FP=Firm Performance, IV=Independent Variable, DV=Dependent  
 Variable, MV=Mediating Variable. Path-A=IV→MV, Path-B=MV→DV, Path-C=IV→DV, Path-C'=IV→MV→DV, \*\*\*P<0.001

**Table 5: Interactive effect of KIC in between Knowledge Processes & EC**

Relationships	R <sup>2</sup>	Adj. R <sup>2</sup>	f-value	β	S.E.E	t-value	ρ
KAC-KIC→EC	0.502	0.471	60.71				***
KAC→EC				0.34	0.05	9.11	***
KIC→EC				0.37	0.06	11.23	***
KAC-KIC-KAC*KIC→EC	0.575	0.547	70.34				***
KAC*KIC→EC				-0.58	0.04	12.72	0.004
KCN-KIC→EC	0.712	0.691	80.71				***
KCN→EC				0.54	0.06	9.02	***
KIC→EC				0.45	0.06	8.45	***
KCN-KIC-KCN*KIC→EC	0.722	0.699	83.46				***
KCN*KIC→EC				-0.63	0.05	8.89	0.023
KAP-KIC→EC	0.573	0.561	70.64				***
KAP→EC				0.51	0.06	9.02	***
KIC→EC				0.48	0.06	9.01	***
KAP-KIC-KAP*KIC→EC	0.597	0.573	69.03				***
KAP*KIC→EC				-0.88	0.04	8.67	***
KSG-KIC→EC	0.439	0.424	70.63				***
KSG→EC				0.51	0.06	10.22	***
KIC→EC				0.45	0.06	9.03	***
KSG-KIC-KSG*KIC→EC	0.451	0.44	68.33				***
KSG*KIC→EC				-0.61	0.04	9.45	0.005
KPT-KIC→EC	0.324	0.301	46.34				***
KPT→EC				0.33	0.06	8.43	***
KIC→EC				0.29	0.06	7.42	***
KPT-KIC-KPT*KIC→EC	0.331	0.329	44.17				***
KPT*KIC→EC				-0.58	0.04	2.34	0.043

Notes: KAC=Knowledge Acquisition, KCN=Knowledge Conversion, KSG=Knowledge Sharing, KAP=Knowledge Application, KPT=Knowledge Protection, EC=Employee Creativity, S.E.E= Standard Error of Estimate, \*\*\*p<0.001

**Figure 1: Conceptual model**



**Figure 2: Interaction effects of knowledge intensive culture on the relationship between knowledge processes and employee creativity**

