

IMPACT OF KM PRACTICES ON FIRMS' PERFORMANCE: A MEDIATING ROLE OF BUSINESS PROCESS CAPABILITY AND ORGANIZATIONAL LEARNING

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Abstract. This study tends to examine the mediating role of business process capabilities and organizational learning in order to validate the KM practices driven performance. A mediating model is proposed and confirmatory factor analysis is performed through structural equation modeling to assess the overall measurement model. The results of the study confirm that KM practices have positive and significant association on overall performance of firms and as well intermediate measures (business process capability and organizational learning) have positive and significant connection with KM practices and overall performance of firms. Further, the results of the study reveal that KM practices are partially rooted through business process capabilities and completely mediated by organizational learning. It suggests that both intermediate measures are complementary for KM practices driven performance more specifically the organizational learning. The results of the study postulate that KM practices provide foundation to KM-driven performance, where business process capability and organization learning are two important drivers for value creation process. An organization has bundle of knowledge resources and capabilities, so it should dedicate its efforts to identify and implement more KM practices as well for the improvement of business process capabilities and organizational learning to better realized KM-oriented performance.

Keywords: Knowledge management, Business process capability, Organizational learning, Firm's performance

JEL classification: D23, L25, M10, M15

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I. INTRODUCTION

In a global dynamic environment, there has been a radical change in the approach of both the academicians and the business community. Demands of competitive world have forced the organizations to strive for the professionally managed end results. Many organizations are shifting towards knowledge driven systems and are utilizing the Knowledge Management (KM) processes and practices to enhance their competitiveness and effectiveness (Guillen, 2000; Rivard *et al.*, 2006; Gold *et al.*, 2001; Mills and Smith, 2011; Zack *et al.*, 2009). The key issue is how to improve the organizational capabilities to make the internal performance recurrent and create sustainable competitiveness in this ever changing environment. This research aims towards determining the influence of KM practices on overall performance of firms and further to investigate the mediating role of business process capability and organizational learning. Further, it also attempts to evaluate that how the implementation of KM practices enhance the overall performance of firms. Therefore, this study used KM practices that have more affirmative effect on the performance outcomes (Zack *et al.*, 2009; Nonaka, 1994; Davenport and Prusak, 1998; Choi and Lee, 2003).

Today knowledge derives the economy. Many studies considered knowledge as a primary source of input for value creation rather than the physical or traditional capital, such as land, equipment, and raw material (Gold *et al.*, 2001; Wu and Chen, 2014; Zack *et al.*, 2009). Prior research suggests that achieving outstanding performance outcomes is not only dependent on the effective placement of physical assets but also on the management of knowledge resources and capabilities (Gold *et al.*, 2001; Lee and Sukoco, 2007; Mills and Smith, 2011; Zack *et al.*, 2009). KM has emerged as an important concept over the last fifteen years; therefore it builds upon the extension of resource based view (RBV) into knowledge-based view (KBV). Organizations are substantially investing on KM-initiatives for the purpose of effective maintenance and flow of knowledge within and outside of the organization. RBV suggests that organizations have bundle of knowledge resources and capabilities, which are valuable, rare and non-substitutable, used for achieving sustainable competitive advantage and superior performance standards (Barney, 1991; Karkoulian *et al.*, 2013). Karkoulian *et al.* (2013) postulate that knowledge resources are unique and imitable tends to provide competitive advantage.

KBV is an extension of RBV (Spender, 1996; Guillen, 2000; Rivard *et al.*, 2006). It suggests that identification of knowledge resources, assets and capabilities perform important role for KM practices driven performance

(Tanriverdi, 2005; Gold *et al.*, 2001; Zack *et al.*, 2009). It is widely recognized that knowledge is a critical strategic resource for sustainable competitive advantage (Zaied *et al.*, 2012; Choi *et al.*, 2008; Bollinger and Smith, 2001; Teece, 1998; Grant, 1997). It has become an important factor in addition to previously well-known factors such as land, labor and capital (Sher and Lee, 2004). In current era, if the managers are asked to underline any single resource, which is most critical for them to achieve sustainable competitive advantage, that might be "knowledge". Keeping in view, the importance of knowledge as a strategic valuable resource motivates the practitioners to pay more attention towards KM strategies. The extant of literature shows that organizations are substantially investing on KM initiatives in order to acquire and exploit this strategic resource in a better way (Sarvary, 1999). Capturing most valuable knowledge and distributing it effectively throughout the organization is a critical issue for many organizations. Therefore, KM has become the main priority for all the organizations due to its linkage with different performance measures (Bhojaraju, 2005). Therefore, from the above discussion it may be concluded that the vital resource of today's organization is the collective knowledge that resides in the minds of people (Davenport and Prusak, 1998).

Considering KM as an area of academic research, a number of journals have published the different theoretical models for KM maturity. Several empirical studies are available in the literature that have primarily focused on the relationship of KM with organizational performance (Zack *et al.*, 2009; Nonaka, 1994; Davenport and Prusak, 1998; Choi and Lee, 2003; Marques and Simon 2006). Although this part of study provides some valuable insights using some intermediate measures (business process capability and organizational learning) that help to confirm the flow of relation of KM with organizational performance. As discussed above, there are massive empirical studies attempted to examine the relationship of KM practices with performance outcomes (Zack *et al.*, 2009; Marques and Simon 2006). Possibly, the most significant gap is lack of studies to determine the relationship of KM practices with performance through intermediate measures. Few survey studies have been conducted to examine the KM-driven performance with other factors (Wu and Chen 2014; Moffett *et al.*, 2003; McCann and Buckner, 2004). Therefore, this exploratory quantitative study is conducted to investigate the nature of relationship between KM and performance with the help of intermediate measures to set the evidence. The main objective of this study is to frame organization's competitive strategies with the help of KM and intermediate measures. Keeping it in view, the survey has been administered to know respondent's opinion about firms'

involvement in KM practices because KM is one of the valuable strategic resource for organizations' success (Zack, 1999) and as well helps to frame the new business process to achieve better performance outcomes (Easterby-Smith and Lyles, 2003; Wu and Hu, 2012; Wu and Chen, 2014).

Studies have also developed a competence-based view (CBV) regarding the importance of the KM practices of the firms. Marques and Simon (2006) agree that by adopting KM practices a firm could obtain better results as compare to its competitors. Further, KM enables to launch new business processes to obtain better performance outcomes (Easterby-Smith and Lyles, 2003; Wu and Hu, 2012). Business processes work as mediator role for KM-enabled performance in value creation process. Kaplan and Norton (2001) attempted to examine the relationship of internal processes with performance through BSC balanced scorecard. Similarly, organizational learning is also an important mediator for KM-driven performance which continuously helps to identify, create, and utilize the knowledge in an effective way (Chiva and Alegre, 2005; King, 2009; Zhao *et al.*, 2013; Wu and Chen, 2014). Spender (2008) describes that organizational learning is all about management of newly created knowledge. This confirms that both business processes and organizational learning are important mediators for KM practices driven performance (Easterby-Smith and Lyles, 2003; Wu and Hu, 2012; Wu and Chen, 2015).

The results of study reveal positive connection between KM practices and overall firms' performance as suggested in prior KM literature (Nonaka, 1994; Davenport and Prusak, 1998; Choi and Lee, 2003; Simonin, 1997; Tanriverdi, 2005; Marques and Simmon, 2006; Darroch and McNaughton, 2002) and among others. More specifically, it is found that KM practices are directly related to intermediate measures (namely business process capability and organizational learning) and in turn these intermediate measures create positive and significant link with overall firms' performance. Moreover, the results of study also confirm that business process capabilities partially mediates the relationship between KM practices and overall performance and whereas, organizational learning completely mediate the relationship of KM practices and overall performance. So, results indicate that this type of partially mediating role of business process capabilities are in line with generally suggested by previous KM-based literature (Easterby-Smith and Lyles, 2003; Wu and Hu, 2012; Wu and Chen 2014) and for organizational learning completely mediate the relationship of KM-driven performance are also consistent with earlier studies (for details see Zhao *et al.*, 2013; Chiva and Alegre, 2005; King, 2009). It may be concluded that how critically complementary are business process capabilities and organizational learning

to KM-based performance because business process capability tends to improve performance outcomes by exploiting the business processes (Spender, 2008) and organizational learning helps for creation and utilization of new knowledge (Easterby-Smith and Lyles, 2003) for better performance (Zhao *et al.*, 2013).

II. THEORETICAL MODEL AND HYPOTHESES

Knowledge Management and Overall Performance

KM comprises set of strategies and practices used in an organization to identify, create, represent, distribute and enable adoption of insights and experiences. It is the collection of processes that govern the creation, dissemination, and utilization of knowledge for improving the performance of firms (Davenport and Prusak, 1998). Prior research presents positive connection of KM with both financial (Tanriverdi, 2005; Zack *et al.*, 2009; Wu and Hu, 2012; Wu and Chen, 2014) and non-financial measures such as product quality and leadership, innovation, and operational performance (Mukherjee *et al.*, 1998; Lapre and Wassenhove, 2001; Forcadell and Guadamillas, 2002). Latest research indicates that a few studies have also been conducted while considering the both financial and non-financial aspects of firms to measure the overall performance of firms (Zack *et al.*, 2009; Wu and Chen, 2014; Wang *et al.*, 2014).

Zack *et al.* (2009) find that KM practices are positively associated with organizational performance (*i.e.* operational excellence, customer intimacy and product leadership) jointly referred as value disciplines that in turn positively influence the financial performance. However, Zack's (2009) study is unable to find any positive connection between KM practices and financial performance, therefore, suggesting that firms need to include more intermediate measures and should measure the overall performance of firms by combining the value discipline (operational excellence, product leadership and customer intimacy) and financial measures (Profitability, ROA/ROI, and ROE). To bridge the gap, this study is an attempt to test the flow of relation between KM practices and overall performance using business process capabilities and organizational learning as intermediate measures.

Many studies find moderately weak to strong relationship of KM with both financial and non-financial performance measures (Simonin, 1997; Schulz and Jobe, 2001; Lee and Choi, 2003; Tanriverdi 2005; Darroch and McNaughton, 2003). Studies also examine the impacts of KM capabilities which comprise of knowledge infrastructure (*i.e.* technology, culture, organizational structure) and knowledge process capability (*i.e.* creation,

conversion, application and protection) on various dimensions of organizational performance (Grant, 1996; Gold *et al.* 2001; Lee and Sukoco, 2007; Zack *et al.*, 2009; Mills and Smith 2011). They find positive and significant connections of KM capabilities on organizational performance, considering innovation, customers' affection, product leadership, operational efficiency, responsiveness/awareness as important measures of firms' performance. Based on above discussion it is expected that KM practices may have positive association with overall performance of firms considering operational excellency, product intimacy, product leadership, profitability, ROA/ROI and ROE as important dimensions to assess the overall performance of firms.

H_{1a} There exists a positive relationship between KM practices and overall performance of firms.

Knowledge Management and Business Process Capabilities

In current era, both knowledge and business process capabilities are integral elements for organizational success (Gold *et al.*, 2001; Mills and Smith, 2011). Starns and Odom (2006) have also emphasized that accurate KM practices must be integrated into an organization's management structure and business strategy if it wants to improve its capabilities and effectiveness. Davenport (1993) defines business process as explicit series of work activities for transforming a set of inputs into outputs. Barney (1991) argues that RBV suggests that business process capabilities provide specific setting within which to examine the way organization utilize the resources. Studies also suggest that business processes can be thought as the routine set of activities that a firm develops in order to gain competitive advantage (Nelson and Winter, 1982; Porter, 1991). Wu and Chen (2014) find that business process capabilities enable the organizational competence in a unique way and thus increases the market value. This indicates that business process describes how an organization performs and implements the given capabilities. Moreover, business processes are actions that firms engage in for achieving its organization objectives and tasks.

Examples of business processes include the process of acquiring supplies, and other raw materials, the process of producing products and services, the process of delivering products and services to its customers and the process of providing after sales services (Porter, 1985). Many researchers argue that resources themselves cannot only be a source of competitive advantage; they can only be a source of competitive advantage if these are exploited through business processes and thus these processes enable to improve its products and services, achieving competitive advantage and

superior performance outcomes (Day, 1994; Fahy and Hooley, 2002). This study uses the Day (1994) and Fahy and Hooley (2002) typologies which is based on three categories that is outside-in capacity, inside-out capacity and spanning capacity.

Outside-in capability refers to firm's ability in anticipating market demands, screening out external rivalries, establishing long-term strategic alliance with external stakeholders, and responding to market changes rapidly (Fahy and Hooley, 2002). Wade and Hulland (2004) state that outside-in capability is the ability of organization to focus and emphasize external environment (opportunities and threats) to corroborate it with internal processes. Day (1994) points out that outside-in capabilities consist of market-sensing capability and relationship-linking capability.

In market-sensing capabilities, an organization can anticipate the market demand, generate the market intelligence, and disseminate that intelligence towards the members of its organization and gives response according to that intelligence. Capabilities are considered as complex set of bundles of skills and collective learning through organizational processes that ensure superior coordination of functional activities (Day, 1994) and market sensing capability is considered as one of the most critical capability. It is the ability of an organization to be aware about changes in the market and forecast accurate responses to its marketing actions (Day, 1994). Further in market-sensing capabilities, market researchers studying customer behavior in the market, apply many tools such as questionnaires, interviews, feedback forms and much more in order to achieve their goals and objectives. In this way, an organization can get better understanding about their customers such as their needs, liking and disliking etc.

Secondly, relationship-linking capabilities refer to an organization's ability to construct strategic alliances with external stakeholders. Day (1994) describes that these are the abilities of an organization to create and manage close customer relations. Relationship-linking capabilities are important for building a customer loyalty and increase customer satisfaction in order to improve profitability of a firm (Hooley *et al.*, 2005). So, these capabilities tend to construct better relations with customers by providing personalized and customized products and services (Storbacka and Lehtinen, 2001).

Banker *et al.* (2006) state that inside-out capabilities refer to firm's ability to pursue operational efficiency and effectiveness through internal processes. Wade and Hulland (2004) suggest that inside-out capability tends to focus internally that how better infrastructure and operational excellence would help an organization for achieving sustainable competitive advantage

and as well to leverage the strong value propositions. “Inside-out capabilities are stimulated by market requirements, competitive challenges and external opportunities such as manufacturing and other transformation activities” (Day, 1994). This suggests that these capabilities enable organization to avail market opportunities through products innovativeness and manufacturing processes. These capabilities facilitate to get the information of market demands to make better decision and choose those processes that can perform in an efficient and effective manner in order to produce innovative products at lower cost through effective internal processes. Based on above discussion it may be drawn that inside-out capabilities focus internally (strengths and weaknesses) that how it can effectively manage all the operations and develop better infrastructure sustainable competitive position.

Spanning capabilities are the combination of inside-out and outside-in capabilities of an organization. Spanning capability enables firm to identify valuable strengths, exploit opportunities, avoid potential weaknesses and neutralize external threats through internal and external analyses (Wu and Chen, 2014). Banker *et al.* (2006) and Wade and Hulland (2004) argue that for strategic development based on inter-and intra-organizational alliances and enterprise wide information integration are the critical elements for spanning capability.

Above discussion suggests that KM performs crucial part to reshaping the business process (Wu, 2002; Brynjolfsson and Hitt, 2003). KM literature suggests that it has been emerged as the most valuable strategic resources that enable the organization to integrate new business process that can further help to achieve better performance outcomes (Easterby-Smith and Lyles, 2003). KM involves identification and integration of knowledge assets and resources which is embedded in routine set of activities within an organizational context (Nonaka *et al.*, 2000; Gold *et al.*, 2001). Easterby-Smith and Prieto (2008) find that business process capabilities are considered as important input to formulate and implement the business strategies as well to create, transfer, and integrate application of knowledge resources that help to improve the both internal and external business processes. Further they also find that organizations tend to align business activities effectively that help to exploit the tangible and intangible assets in a unique way. Accordingly, this suggests the strong connection of KM with business process capabilities which help to construct the following hypothesis.

H_{1b} There exists a positive relationship between KM practices and business process capabilities.

Business Process Capabilities and Overall Performance

Extant of literature based on KM-driven performance remain inconclusive because many studies have concluded that aggregated measures (both financial and non-financial) tend to provide more clear picture to estimate the overall performance of firms (Bharadwaj, 2000; Devaraj and Kohli, 2003). A number of studies on KM-driven performance have proposed an aggregated set of measures both financial and non-financial including operational measures (process quality, process efficiency, delivery dependability, and inventory reduction), market-based measures (customer relationship, product leadership, and time to market), and financial measures (revenue growth, return on investment, profitability) (Melville *et al.*, 2004; Tanriverdi, 2005). Recent studies have also proposed aggregated measures to appropriately examine the KM-driven performance (Wu and Chen, 2014; Wang *et al.*, 2014).

RBV suggests that competitive advantage is more likely to be connected with capability based advantage (Helfat and Peteraf, 2003). Researchers argue that business process capability being valuable resource is more likely to be associated with sustainable firms' performance (Day, 1994; Fahy and Hooley, 2002). Few studies also have suggested that business process capability is an important mediator for KM-driven performance (Helfat and Peteraf, 2003; Haas and Hansen, 2005). Many studies have found that business process capability more specifically; customer relationship management, flexible production processes and supply chain management have direct connection with organizational performance measures (Ray *et al.*, 2004; Rai *et al.*, 2006; Santhanam *et al.*, 2007). Based on above discussion, it may be concluded that business process capability is an important mediator for KM-driven performance, further it has positive connection with KM and performance measures. Hence this research posits the following hypothesis.

H_{1c} There exists a positive relationship between KM practices and business process capabilities.

Organizational Learning Important Mediator for KM-Driven Performance

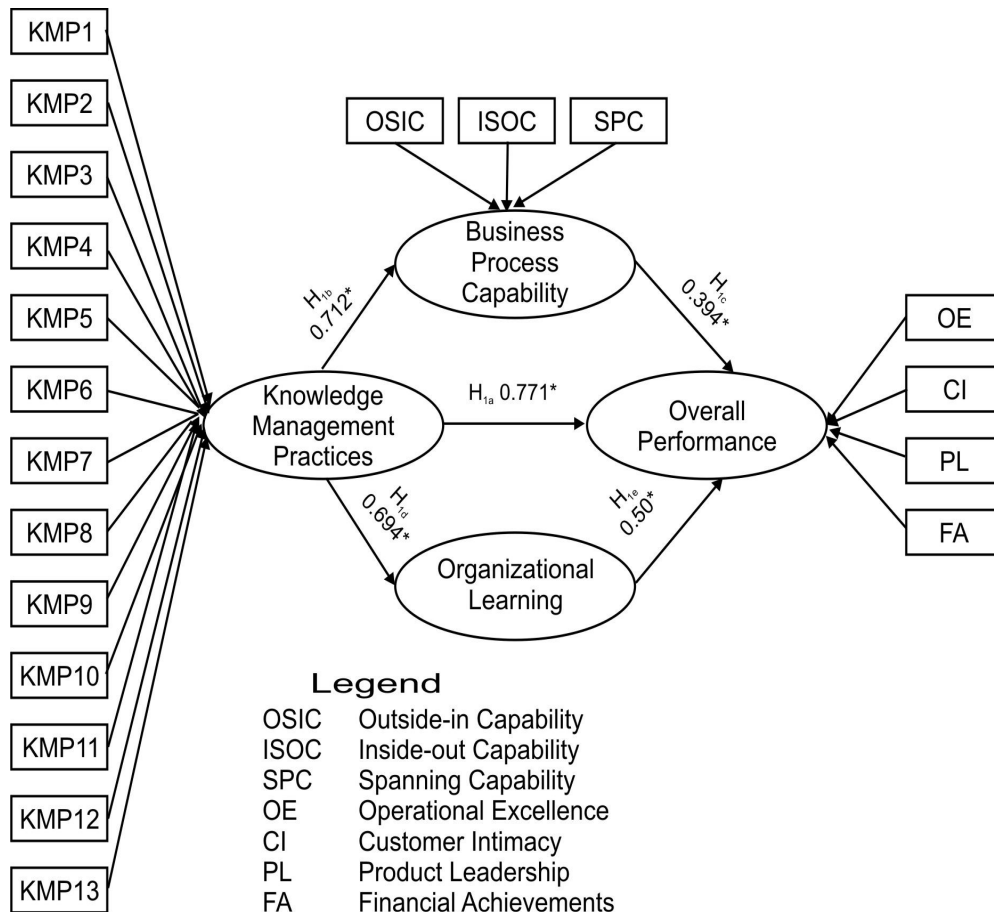
Organizations cannot survive and improve themselves without learning. There is a need to learn in order to survive in the globally competitive environment (Hannch and Lester, 2009). Learning starts from individuals and it occurs at both individual and organizational level in the firms. Dixon (2000, p. 41) defines learning as "the process of interpreting what we experience in the world". Most of the learning processes in the organizations

are based on the expectation that the employees will learn and implement what they have learned (Spector, 2003). Many researchers used the terms organizational learning and learning organization interchangeably despite of their different meanings. Organizational learning is the individual's collaborative learning process while the learning organization is an organization which promotes continuous learning among individuals (Song, *et al.*, 2009). Organizational learning is an important mediator between KM and organization performance. King (2009) describes that learning is the main facilitator for KM-driven performance. It also enables to transform the organizational embedded knowledge into organizational processes through creation, transfer and application of knowledge that tends to continuously improve organizational procedures and practices (Wu and Chen, 2014). Organization learning process can be successful when it is able to create the knowledge successfully and then retain it and also spread properly within the organization. Tsoukas and Mylonopoulos (2004) state that organizational learning continuously aligns the activities and improves the understanding of organization in a similar way to create knowledge and then to manage the knowledge.

More explicitly, organizational learning is the ability of an organization to process knowledge and to adjust its behavior to reflect the new cognitive situation for the purpose of improving its performance (Jerez-Gomez *et al.* 2005). Tsang (1997) explains that the organizational learning is a process which is comprised of certain types of activities that happen in an organization. Organizations learn through past history by making improvements in the previously taken actions (Fiol and Lyles, 1985). According to Draft and Weick (1984) organizational learning is the knowledge between actions and environment of the organization. Fang *et al.* (2011) empirically prove that the organizational learning increases the performance of the firm with the time line. Mabey and Salman (1995) also explain this perspective that organization learns collectively according to their capacity, pace and intentions. They argue that the organizational learning has positive impact on performances. Organization learning is one of important ways in which organization can sustainably improve its utilization of knowledge (King, 2009). According to Hult *et al.* (2001), organizational learning is the knowledge and the capacity to develop knowledge within the organization. Moreover, Lopez *et al.* (2004) argue that KM and organizational learning should "go hand in hand" in the organization for achieving superior performance.

Bates and Khasawneh (2005) describe that organizational learning enhances and supports the acquisition, distribution and sharing of the

knowledge and is therefore closely associated with KM (Zack *et al.*, 2014). Culture plays an important role to improve learning capability of employees and consider critical success factor for KM (Gold *et al.*, 2001). Learning process enables to get new knowledge and information related to its internal and external environment, goals and objectives of the organization. Under this process, employees of an organization learn new procedures and then apply this knowledge within their organization processes. It also helps the organization to effectively use its organizational knowledge into organization processes by motivating the creation, acquisition, conversion storage, transfer, sharing and reuse of knowledge in order to improve its organization practices and business operational activities. Based on the above discussion, it may be concluded that learning is the process through which we create new knowledge, share and improve the existing knowledge. Moreover, it may be related to effective processing and interpretation about the organization internal and external information.



H_{1d} There exists a positive relationship between KM practices and organizational learning.

H_{1e} There exists a positive relationship between organizational and overall performance.

III. RESEARCH METHODOLOGY

Data Collection

A survey instrument (questionnaire) is used to collect the data from the respondents. Surveys are specifically designed for accurate measurement of theoretical constructs, rapid data collection, extensive data analysis using radical statistical techniques and quantitatively examination of complex relationships (Gable, 1994). A random sample was drawn from telecom sector in the province of Punjab (one of the most developed and populated province of Pakistan). The sampling choice of study was based on three considerations: firstly, telecom sector is one of the most high-tech sectors of Pakistan and KM plays crucial role for knowledge related production and innovativeness to survive in competitive environment. Secondly, this study will induce the other high-tech industries to pay more attention for KM development to achieve competitive advantage. Thirdly, it is expected that KM in selected firms would improve overall performance of firms and thus providing the unique setting for investigating the relationship between KM practices and performance. Setting the survey method (key informant approach), advocates that the senior managers are the best source of information providers; we distributed 1500 questionnaires, 666 questionnaires were considered for analysis and remaining were discarded due to the incomplete or selecting the same response for the questions, this represents 44.4% response which is quite comprehensive response for this study. The instrument used in the study (given in Appendix) comprises of five parts. First part of instrument provides the basic information of respondents at nominal scales and remaining parts of instrument attempt to capture the respondents' response about independent (KM practices), mediating (organizational learning and business process capability) and dependent variables (overall performance).

Instrumentation

All the measurement items were adapted from existing literature to ensure the reliability and content validity of instrument, especially for measuring the latent constructs. The KM practices were identified and adapted from the work of Zack *et al.* (2009), Davenport and Prusak (1998), Nonaka (1994),

Lee and Yang (2000), Lee and Choi (2003), Sher and Lee (2004), Chan *et al.* (1997), Gold *et al.* (2001), Tallon *et al.* (2000) and others. The organizational learning was adapted from Jerez-Gomez *et al.* (2005) and 4 items were identified to define this construct. Business process capabilities were adapted from the work of Banker *et al.* (2006) and Wade and Hulland (2004), which includes three sub-constructs (*i.e.* outside-in, inside-out and spanning) and total 12 items were used to elaborate this concept. The overall performance is measured using further four sub-constructs (*i.e.* operational excellence, customer intimacy, product leadership and financial performance) adapted from Bowersox *et al.* (2000), Inman *et al.* (2011), Vaccaro *et al.* (2010), Rai *et al.* (2006) and others. There were eleven measurement items used to elaborate these four sub-constructs (three items for operational excellence, two items for customer intimacy, two items for product leadership and four items for financial performance). Initially, questionnaire containing all the questions were written in English and little amendments were made to modify the questionnaire as per the setting of study. Instrument was pre-tested by a panel of experts containing three professors, two senior managers from each sector were selected to ensure the face validity of the instrument. They were asked to examine the instrument, its each items and constructs including the format, wording and length. Pre-testing (pilot study) based on little revisions was made as per nature and setting of study and a final questionnaire was developed on five point Likert scale (1 = strongly disagree and 5 = strongly agree) after re-modification as per the feedback of participants.

IV. FINDINGS OF STUDY

Measurement Model

The study has assessed the confirmatory factor analysis (CFA) by employing structural equation model to estimate the overall measurement model. The principal objective of measurement model is also to assess the convergent and discriminant validity for further model examination (Fornell and Larcker, 1981; Hurley *et al.*, 1997). Convergent validity refers propensity that all items, used in measurement model, are supposed to validate with each other (Wang and Wang, 2012; Wang *et al.*, 2014). In first stage, the study has evaluated the convergent validity by assessing the value of factor loadings (λ) should be statistically significant and larger than minimum threshold of 0.60, composite reliabilities should be greater than 0.80 and average variance extracted for all the measurement items should be higher than minimum threshold of 0.50 (Fornell and Larcker, 1981). For assessing the convergent, Chin *et al.* (2003) set the following three criteria: first

TABLE 1

Results of CFA and Internal Reliability Testing

Constructs	Measurement Items	Mean	SD	Standard Loading	Cronbach alpha's (C- α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Knowledge Management Practices	KMP1	3.13	0.75	0.88	0.88	0.91	0.744
	KMP2			0.87			
	KMP3			0.89			
	KMP4			0.91			
	KMP5			0.87			
	KMP6			0.84			
	KMP7			0.83			
	KMP8			0.84			
	KMP9			0.81			
	KMP10			0.83			
	KMP11			0.85			
	KMP12			0.86			
	KMP13			0.87			
Business Process Capability	OIC1	3.19	0.72	0.81	0.91	0.84	0.671
	OIC2			0.83			
	OIC3			0.80			
	OIC4			0.78			
	IIC1			0.83			
	IIC2			0.77			
	IIC3			0.87			
	SC1			0.88			
	SC2			0.76			
	SC3			0.86			
Organization Learning	OL1	3.10	0.79	0.78	0.84	0.82	0.611
	OL2			0.81			
	OL3			0.73			
	OL4			0.76			
	OL5			0.83			
Organizational Performance	OE1	3.15	0.71	0.89	0.92	0.83	0.695
	OE2			0.81			
	OE3			0.83			
	CI1			0.78			
	CI2			0.86			
	PQ1			0.81			
	PQ2			0.93			
	FE1			0.73			
	FE2			0.79			
	FE3			0.85			
	FE4			0.89			

loadings items should be greater than threshold level of 0.70, second, composite reliabilities which can be evaluated by using coefficient of alpha (C- α) should be larger than 0.80 and average variance extracted (AVE) for all the constructs should also more than 0.50. Third, like others, Bagozzi and Yi (1988) suggest the minimum thresholds for (C- $\alpha \geq 0.7$; CR ≥ 0.7 ; AVE ≥ 0.5) for further model investigation. In general, Hair *et al.* (1998) state that all loading items (λ) must be greater than 0.35 for having practical significance. To test the convergent validity, in measurement model, all the loading items (λ) lie between 0.73-0.91, composite reliabilities ranges from 0.80-0.95 and values of AVE come between 0.61-0.74. So, these results indicate that measurement model meets the criteria of convergent validity. We have assessed the internal reliabilities of scale using coefficient of Cronbach alpha's (C- α). The values of (C- α) ranges from 0.84 to 0.92 demonstrating high internal consistency exceeds the minimum threshold of 0.70 (Nunnly and Bernstein, 1994). The values of (C- $\alpha = 0.70$ or above) would be considered more preferable for analysis (Aron and Aron, 2002; Sekaran, 2002). Table 1 represents means, standard deviation, loadings items (λ), composite reliabilities, average variance extracted and coefficient of (C- α) for all the measurement items included in the model.

The study also assesses the discriminant validity. Kline (2010) argues that discriminant validity refers that all items used to measure the constructs do not estimate the theoretically unrelated constructs. Likewise other studies, the study uses the Fornell and Larcker (1981) typology to assess the discriminant validity. This approach suggests that "average variance extracted (AVE) for each constructs should be larger than squared correlation between the same constructs and any other constructs" (Wang *et al.*, 2014, p. 18). Table 2 suggests that square root of average variance extracted is greater than correlation of constructions (square root of AVE > correlation of constructs), hence discriminant validity is established, so both convergent and discriminant validity lead to better constructs validity to proceed for further analysis.

In second stage, the study has also assessed the fitness of model by estimating (1) absolute fit measures: $X^2/df = 2.858$, GFI = 0.860, RMSEA = 0.053. Incremental fit measures: NFI = 0.780, AGFI = 0.843, CFI = 0.844. Parsimonious fit measures: PGFI = 0.768, PNFI = 0.734. Table 3 presents the overall fit indices of the CFA model with scores and recommended cut-off value, suggesting that all values meet satisfactory levels of fit indices, confirming that model is fit and hence is suitable for testing the proposed hypotheses.

TABLE 2

Intercorrelation, Means and Standardizations Between the Constructs

Variables	KMP	BPC	OL	OP	M	SD
KMP	0.86	—	—	—	3.13	0.72
BPC	0.67	0.82	—	—	3.19	0.79
OL	0.61	0.60	0.78	—	3.10	0.79
OP	0.68	0.67	0.67	0.83	0.92	0.71

Diagonal Value: Square root of the AVE, Non-diagonal value: Correlation

TABLE 3

CFA Results for Model Fitness

Fit Index	Scores	Standardized Cut-off Value
Absolute Fit Measures		
χ^2/df	2.858	$\leq 2^a; \leq 5^b$
GFI	0.860	$\geq 0.90^a; \geq 0.80$
RMSEA	0.053	$< 0.08^a; < 0.10$
Incremental Fit Measures		
NFI	0.780	$\geq 0.90^a$
AGFI	0.843	$\geq 0.90^a; \geq 0.80^b$
CFI	0.844	$\geq 0.90^a$
Parsimonious Fit Measures		
PGFI	0.768	The higher, the better
PNFI	0.734	The higher, the better

Notes: Acceptability Criterion: ^aacceptable; ^bmarginal

Structural Model

Table 4 demonstrates the results of structural model using standardized path coefficients which show the relationship among latent variables. First hypothesis (H_{1a}) suggests the positive relationship of KM practices with organizational performance. The effect of KM practices on organizational

performance is 0.771 at ($p < 0.001$), thus supporting the hypothesis H_{1a}. Likewise, hypotheses H_{1b}, H_{1c}, H_{1d} and H_{1e} have also positive relationship of KM practices with business process capability ($\beta = 0.712$), business process capability with organizational performance ($\beta = 0.394$), KM practices with organizational learning ($\beta = 0.694$) and organizational learning with organizational performance ($\beta = 0.500$). All these relationships are statistical significant at ($p < 0.001$).

TABLE 4
Standardized Path Coefficients

Hypothesis		Estimates	P-value	SE	Remarks
H _{1a}	KMP → OP	0.771*	< 0.001	0.091	Supported
H _{1b}	KMP → BPC	0.712*	< 0.001	0.068	Supported
H _{1c}	BPC → OP	0.394*	< 0.001	0.083	Supported
H _{1d}	KMP → OL	0.694*	< 0.001	0.067	Supported
H _{1e}	OL → OP	0.500*	< 0.001	0.087	Supported

Note: * significant at the 0.001 level (2-tailed), ** significant at the 0.05 level (2-tailed), *** significant at the 0.10 level (2-tailed).

Mediation Analysis

First of all, for analyzing the mediation analysis, the direct effect of independent variable on dependent variable and indirect effect of independent variable on dependent variable through mediating variables are examined. Table 5 presents the direct effect of independent variable (KM practices) on dependent variable (organizational performance), which is statistically significant at ($p < 0.001$) thus confirms the first assumption of mediation (*see* Baron and Kenny, 1986).

TABLE 5
Direct Effect (Before Mediating Variables)

Variables	Beta Estimate	SE	CR	P-value	Result
KMP → OP	0.771	0.074	10.365	0.000	Significant

Tables 6 and 7 present the indirect effect of KM practices on organizational performance using business process capability and organizational

learning as mediating variables. Table 6 shows while testing the mediating role of business process capability, the effect of KM practices on organizational performance is reduced from 0.771 to 0.401 which still remains significant ($p < 0.05$), thus suggests that business process capability partially mediates the relationship of KM practices and organizational performance. Further the effect of KM practices on business process capability and business process capability on organizational performance are positively associated at ($p < 0.001$). However, Table 7 represents indirect effect of KM practices on organizational performance through mediating role of organizational learning. Table 7 also reveals that while examining the indirect effect, the value of beta estimate is reduced from 0.401 to 0.158, but its relationship does not remain statistically significant ($p > 0.05$) which confirms that organizational learning completely mediates the relationship of KM practices and overall organizational performance.

TABLE 6
Indirect Effect (with Business Process Capability)

Variables	Beta Estimate	SE	CR	P-value	Result
KMP → OP	0.401	0.071	5.678	0.000	Significant
KMP → BPC	0.686	0.067	10.287	0.000	Significant
BPC → OP	0.528	0.087	6.078	0.000	Significant

TABLE 7
Indirect Effect (with Organizational Learning)

Variables	Beta Estimate	SE	CR	P-value	Result
KMP → OP	0.158	0.091	1.732	0.083	Not significant
KMP → OL	0.694	0.067	10.355	0.000	Significant
OL → OP	0.500	0.087	5.726	0.000	Significant

For more understanding the mediating role of business process capability and organizational learning, the direct, indirect and total effect were also calculated. Table 8 clearly reveals that indirect effect is potentially reduced from 0.771 to 0.401 and 0.401 to 0.158 in both cases of mediation, thus suggesting partial mediation in case business process capability and full mediation in case of organizational learning.

TABLE 8

Direct, Indirect and Total Effect Analysis

Predictor/Dependent	KMP	BPC	OL	OP
Direct Effects				
KMP	—	0.712	0.694	0.771
BPC	—	—	—	0.394
OL	—	—	—	0.500
Indirect Effects				
KMP via BPC	—	—	—	0.401
KMP via OL	—	—	—	0.158
Total Effects				
KMP				0.559

V. DISCUSSIONS OF THE STUDY

The findings of study have three fold concerns. Firstly, KM practices significantly and positively contribute to overall performance of firms which is a combination of operational excellence, customer intimation, product leadership and financial achievements. Secondly, mediating variables business process capability and organizational learnings have also demonstrated positive and significant relationship with overall performance of firms in telecom sector of Pakistan. Finally, the effect of KM practices on performance is partially mediated by business process capability whereas organizational learning completely mediates the relationship between KM practices and firms' performance.

The findings of the study reveal that how KM practices influence the overall performance of firms' through the mediating role of business process capability and organizational learning. Few studies were conducted to examine the KM practices on firms' performance (Marques *et al.*, 2006; Zack *et al.*, 2009). This study puts forward a theoretical model to bridge the most underlying gap and confirms that KM practices not only directly influence the relationship with firms' performance but also indirectly influence the relationship through establishing the mediating role of business process capability and organizational learning. The results of the study

provide some innovative insights into the theory of KBV and suggest positive role of business process capability and organizational learning to establish the more effective impact of KM practices on firms' performance in the presence above mediating model. The positive relationship between KM practices, business process capability and organizational learning is a unique and novel finding in the field of knowledge management. Our study recommends that KM practices provide positive paybacks in terms of improved firms' performance and thus brings out more benefits to organization by investing on KM (Lee *et al.*, 2005; Bogner and Bansal, 2007; Kulkarni *et al.*, 2006) and therefore, suggesting that positive performance outcomes are due to the degree of involvement in KM initiatives by firms. The findings of the study endorse that positive affiliation of KM practices with organizational performance as directed by KM literature (Nonaka, 1994; Simonin, 1997; Davenport and Prusak, 1998; Schulz and Jobe, 2001; Massey *et al.*, 2002; Choi and Lee, 2003). More specifically, it is examined that KM practices are directly related to intermediate variables (namely business process capability and organizational learning) which in turn are positively associated with overall performance measures.

The positive affiliation of KM practices with business process capability validates the findings of Wu and Hu (2012) and Easterby-Smith and Lyles (2003), considering that KM as organizational strategy for creating new business processes for achieving superior performance. The indirect effect of KM practices on overall performance measures via business process capability suggest partial mediation, thus indicating business process capability as an important mediator in the KM-driven value creation process. The findings of study also validate the study of Easterby-Smith and Prieto (2008) suggesting that business process capabilities (outside-in, inside out and spanning) helps to implement effective business strategies enabling to alignment knowledge resources that terns to superior firms' performance. In terms of partially mediating relationship of business process capabilities illustrate that capabilities are usually associated with firm's KM initiatives which are core to gain competitive advantage and long term profitability, thus consistent with the findings of Barney (1991). Further, the results of study are also in line with Day (1994) and Fahy and Hooley (2002) providing significant contribution in theory of RBV, therefore, suggesting that business process capabilities are the strategic value resource for KM-oriented performance which enables the firms to achieve competitive advantage. Finally, the results of study also suggest that for achieving capability bases advantage, organizations should dedicate its efforts for

betterment of business process capability for well achieving final performance outcomes and thus corroborating with the findings of (Helfat and Peteraf, 2003).

The results of study find complete mediation while determining the effect of KM practices on overall performance outcomes, indicating that organizational learning is an important tool for flowing the organizational knowledge into all business units for the purpose of achieving performance. The study suggests that organizational learning may work as (a) capability of organization to process the knowledge, (b) flaring the understanding of organization, (c) help in creating knowledge for use and then manage and (d) facilitator of knowledge, therefore, validating the views of Jerez-Gomez *et al.* (2005), Tsoukas and Mylonopoulos (2004) and King (2009). Furthermore, this complete mediating role indicates that organizational learning helps to transform the embedded knowledge into organizational knowledge through encouraging creation, transfer, and application of knowledge, which jointly improves KM practices thus increases overall performance of firms.

The results of study also confirm the argument of Teece *et al.* (1997) suggesting that organizational learning is one of the strategic valuable capability that works out as a source in knowledge transmission, and therefore positively associated with KM. This indicates that learning capabilities boost the organizational performance through exploiting what are known and exploring new domains of knowledge for future exploitation. Finally, the results of study are also consistent with Zack (2005) suggesting that organizations achieve knowledge superiority only due to their learning capability.

VI. CONCLUSION

The purpose of conducting this research is to examine the extent to which KM practices affect the overall performance of firms' and further to clearly examine the mediating role of business process capability and organizational learning. The study observes the positive effect of KM practices and overall performance, and for business process capability partially mediates the relationship between KM practices and performance outcomes, and whereas for organizational learning completely mediates the relationship. The study also finds that not only KM practices have significant and direct effect on overall performance but also intermediate measures (*i.e.* business process capability and organizational learning) exhibit significant and direct relationship with overall performance of firms. Further, the generic purpose

of study is to define the process for establishing the KM practices-driven performance. The theoretical reasoning for determining the proposed mediating model is two-fold. First of all is to illustrate the productive role of KM practices for augmenting the organizational performance based on KBV. Second one is to investigate the mediating role of intermediates measures for KMP-enabled performance based on KBV. These two aforementioned objectives are robustly addressed and supported as per study expectations. The study encourages the practitioners to identify KM practices and further implement with reasonable expectations that these KM initiatives are in line with their organizations' strategies. The findings of study also motivate the practitioners to put more focus on intermediate measures for their KM initiatives. Further, an organization possesses plentiful of knowledge resources, so it should devote its efforts for the improvement of business process capabilities as base for KM practices-enabled performance. This study is not free from limitations. As proposed research model was based on literature investigated in both European and Far East Asian countries; however, the findings of study were exclusively based on South Asia particularly in the context of Pakistan. Whereas, in other countries, findings of study may be different due to the organizational structure, culture, and technological processes may vary beyond this limited sample. Therefore, future research should consider the human resource, organizational structure and external strategic alliances as fundamental drivers of KM which are prominently neglected in prior research. These are indispensable and need to be carefully considered for the implementation of KM practices.

VII. LIMITATIONS AND CALL FOR FUTURE RESEARCH IMPLICATIONS

The results of the study are consistent with previous theoretical deduction. Besides this, study has certain limitations and calls for future researchers. First, the study is based on cross-sectional research design, which prevents us to draw inference related to causality from hypothesized relationship. This issue might be addressed by considering longitudinal or experimental research design to draw causal inference.

Second, the selected sample for this study is the telecom sector of Pakistan, which is considered to be one of the knowledge-driven sectors among others. Therefore, relationship among KM practices, business process capability, organizational learning and overall firms' performance might be stronger relative to other firms in general. This calls for the future researchers to investigate the relationship in other knowledge-incentive

industries *e.g.* banks, pharmaceutical, chemical, engineering and other high-tech sectors more specifically in the context of South Asian countries.

Finally, the study attempts to bridge the most significant gap by contributing unique insights in the body of knowledge through analyzing the relationship of KM practices driven performance, business process capability, organizational learning and overall firms' performance. However, the study is unable to address the other contextual factors such as critical success factors (*e.g.* KM strategy, capabilities and knowledge assets) as intermediate measures. Therefore, future research must address these contextual factors in order to get more insights.

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APPENDIX I

Measurement Items

Knowledge Management Practices

1. My organization explicitly identifies strategic knowledge as a key element in our planning.
2. My organization gives orientation towards the development, transfer and protection of strategic knowledge.
3. My organization fosters innovative culture that encourages R&D projects.
4. My organization has mechanisms to encourage the members of an organization to share knowledge.
5. My organization benchmarks our strategic knowledge against our competitors.
6. My organization uses strategic knowledge for value creation.
7. My organization is able to identify sources of expertise within our organization.
8. My organization employees are valued for what they know.
9. My organization looks for opportunities to experiment and learn more about customers.
10. My organization encourages and rewards the sharing of knowledge.
11. My organization has effective internal procedures for transferring best practices throughout the organization.
12. My organization exploits external sources of knowledge effectively including customer knowledge.
13. My organization knowledge management group is a recognized source of value creation within the organization.

Business Process Capability**A. External Ability**

1. My organization has ability to anticipate market demands.
2. My organization has ability to compete with external environment.
3. My organization has ability to maintain strategic alliance with external stakeholders.
4. My organization has ability to cope with market changes quickly.

B. Internal Ability

1. My organization has ability to improve product/service innovation.
2. My organization has ability to improve customer services.
3. My organization has ability to improve financial management and cost control.

C. Inter and Intra ability

1. My organization has ability to develop business strategies.
2. My organization has ability to execute strategic alliances with internal and external firms.
3. My organization has ability to facilitate wide information integration.

Organizational Learning

1. My organization has well-defined policy for rewarding feasible innovative ideas.
2. My organization motivates employees to work together in a coordinated manner.
3. My organization employees receive general training which is applied to their usual tasks.
4. My organization considers experiences and ideas provided by internal and external sources as a useful instrument for employees' learning.
5. My organization stimulate organization has better s employees to talk among themselves about new ideas that might be of use to them.

Organizational Performance**A. Operational Excellence**

1. My organization performs well in improving efficiency of products.
2. My organization performs well in improving dependability of delivery processes.
3. My organization performs well in cost management than that of key competitors

B. Customer Intimacy

1. My firm organization performs well in improving customer satisfaction.
2. My firm organization performs well in improving quality of customer service.

C. Product Leadership

1. My firm organization performs well in improving quality of products.
2. My firm organization performs well in improving functionality of products.

D. Financial Achievement

1. My organization performs well in improving revenue growth
2. My organization performs well in improving profit margins.
3. My organization has better Return on investment than that of key competitors
4. My organization has better Return on assets than that of key competitors

APPENDIX II
Path Diagram-CFA

