From knowledge management to organizational performance: Modeling the mediating role of innovation and intellectual capital in Higher Education

Abstract

Purpose – This research aims at empirically investigating the effects of knowledge management (KM) enablers on KM processes in research universities and testing the direct relation between KM processes and organizational performance (OP). This study also proposes to examine the mediating role of intellectual capital (IC) and innovation in the relationship between KM processes and performance of universities.

Design/methodology/approach – Using a sample of 217 academic and administrative personnel from research universities of Pakistan, the hypothesized relationships were tested through partial least squares structural equation modeling (PLS-SEM) technique.

Findings – The results reveal that KM enablers have a significant impact on KM processes. The results also indicate that KM processes influence organizational performance directly and indirectly through innovation and intellectual capital.

Practical implications – Findings of this study reinforce the corporate experience of KM and suggest how administrators of research universities and higher education institutions (HEIs) can promote innovation and IC which in turn enhance organizational performance.

Originality/value – Despite the augmented importance of KM in HEIs or research universities of developing countries, there is a dearth of studies that investigate the interplay of KM, innovation, intellectual capital and organizational performance. This is one of the earliest studies that not only empirically investigate the interaction of KM enablers, KM processes and performance of research universities but also sheds insights into the existing literature by simultaneously investigating mediating role of IC and innovation in the underlying relationship.

Keywords: Knowledge management; innovation; intellectual capital; research universities; Pakistan

Introduction

In the present era, organizations are facing uncertainty, complexity, competition and rapid changes in the business environment (Obeidat, Al-suradi, Masa'deh, & Tarhini, 2016). Based on the knowledge-based view of the firm (KBV) (Grant, 1996), knowledge related resources have been persistently recognized as important strategic assets and more contributing to superior organizational performance (OP) and sustained competitive advantage in such a dynamic and challenging environment (Donate & Guadamillas, 2015; Obeidat, et al., 2016).

The KBV further propounds that capability of an organization to create value rests upon its ability to create, transfer and apply knowledge (Martelo-Landroguez & Cepeda-Carrión, 2016). Particularly, the performance of knowledge-intensive business services (KIBS) is largely dependent on successful management of organizational knowledge (Obeidat et al., 2016).

Research universities being knowledge-driven organizations are primarily involved in learning and knowledge creation, developing, preserving and dissemination through publications and therefore play a vital role in the economic growth and development of a country by generating new ideas (Fullwood & Rowley, 2017; Tan, 2016; Ahmad, Lodhi, Zaman & Naseem, 2015;). Higher education institutions (HEIs) or research universities can improve their processes and services such as teaching, learning, research, curriculum development, administration and strategic planning through effective knowledge management (KM) (Ahmed et al., 2015). Various scholars have defined and examined KM capability of an organization in terms of KM processes and KM enablers (e.g. Al-Hakim & Hassan, 2016; Ngah, Tai & Bontis, 2016; Cho & Korte, 2014; Gharakhani & Mousakhani, 2012; Ho, 2009; Gold, Malhotra, & Segars, 2001). KM processes are commonly defined as activities related to knowledge acquisition, creation, sharing and utilization or application that enhance organizational competitiveness (Obeidat et al., 2016; Darroch, 2005; Nonaka & Takeuchi, 1995). On the other hand, KM enablers refer to all those factors such as organizational structure, leadership, culture and incentives that facilitate KM processes or activities (Al-Hakim & Hassan, 2016; Cho & Korte, 2014; Ho, 2009). KM is inevitable in knowledge-based institutions such as HEIs or research universities not only to provide better return on investment in the form of intellectual capital (IC) and innovation (Fullwood & Rowley, 2017; Yasir, Majid, & Yasir, 2017; Rodríguez-Gómez & Gairín, 2015) but also to enhance their efficacy and performance (Ma'sadeh, Shannak, Maqableh & Tarhini, 2017). Similarly, KM is necessary for successful change implementation (Imran, Bilal, Aslam, & Rahman, 2017) and the accomplishment of organizational goals (Al-Kurdi, El-Haddadeh, & Eldabi, 2018). Therefore, during the recent years, the educational sector has grasped the attention of KM scholars. However, a review of extant literature related to KM and educational research has helped authors identify some imperative gaps that require to be addressed.

First, in the arena of KM, the major challenge posed to management researchers and practitioners is how to manage organizational knowledge assets effectively (Shahzad, Bajwa, Siddiqi, Ahmed, & Sultani, 2016). Despite the augmented importance of KM in research universities (Al-Kurdi et al., 2018) due to complexity and massive existence of knowledge-based resources (Yasir et al., 2017), KM strategies adopted by universities are either inadequate

or inconsistent (Fullwood & Rowley, 2017), specifically in developing countries such as Pakistan (Ahmad, et al., 2015). For instance, universities in developing countries are generally characterized by individualistic culture, rigid organizational structure, lack of leadership participation in KM activities, little awareness about benefits of KM and nonexistence of standardized incentive system (Muqadas, Rehman, Aslam, & Ur-Rahman, 2017; Ramjeawon & Rowley, 2017; Ahmed et al., 2015). Previous research conducted in commercial environment suggests that an integrated and coherent KM strategy that involves KM enablers and KM processes is vital to ensure effective KM leading towards increased innovation and OP (Valaei, Nikhashemi & Javan, 2017; Martelo-Landroguez & Cepeda-Carrión, 2016; Ngah et al., 2016; Zack, McKeen, & Singh, 2009; Ho, 2009; Gold et al., 2001). In the same vein, universities that implement comprehensive KM strategies can not only provide more innovative services to demanding public and achieve their goals (Ahmed et al., 2015) but also can play their role in economic development and societal transformation (Ribeiro & Nagano, 2018). A large number of earlier studies have testified the separate or simultaneous positive impact of KM enablers and processes on performance or effectiveness of organizations (e.g. Ngah, et al, 2016; Shahzad et al., 2016; Chiu & Chen, 2016; Tseng & Lee, 2014; Gold et al., 2001). Despite the existence of such an enormous empirical evidence in the extant literature, limited research works have tested facilitating link of KM enablers towards effective implementation of KM processes in HEIs or universities (Fullwood & Rowley, 2017; Ma'sadeh et al., 2017; Rodríguez-Gómez & Gairín, 2015), particularly in the context of countries with developing and aspirational higher education sector (Ramjeavon & Rowley, 2017). Therefore, researchers call for vigorous empirical investigation of enabling role of organizational factors (i.e. leadership, organizational culture, organizational incentives) in the successful implementation of KM processes in universities (e.g. Muqadas et al., 2017; Masa'deh, Obeidat, & Tarhini 2016).

Second, effective KM does not hinge only upon the association between KM enablers and KM processes. Another question that needs to be addressed is related to the measurable results of KM where the effects of KM processes on OP are still ambiguous (Shahzad et al., 2016). In the same vein, limited studies have empirically investigated the direct or indirect impact of KM on the performance of research universities (e.g. Ahmed at al., 2015). Some scholars such as López-Nicolás and Meroño-Cerdán (2011) and Hsu (2008) assert that KM processes do not directly influence OP; instead, there are other mediating variables that transmit the effects of KM processes to OP. However, according to Wang, Sharma, and Cao (2016), the existing body of literature is almost silent about the role of mediating variables and the

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mediation mechanism between the relationship of KM processes and OP. One stream of research posits that KM creates an innovative environment (Huang & Li, 2009) that enables organizations to achieve enhanced performance (Al-Hakim & Hassan, 2016). Therefore, concluding the relation between KM capabilities and OP, Ngah et al. (2016) emphasized that in future studies innovation should be given serious consideration between the relationship of KM and OP.

In the existing KM and OP related literature, innovation has been commonly studied in terms of product and process innovation, radical and incremental innovation, and/or structural and competence innovation (e.g. Chahal & Bakshi, 2015; Ruiz-Jiménez María del Mar Fuentes-Fuentes, 2013). However, rare research work has been done regarding innovation speed and quality, the two central components of innovation, that transmit the effects of KM processes on OP (Wang et al., 2016). Innovation speed refers to an organization's ability to accelerate development and commercialization of products or services for attaining competitive edge (Allocca & Kessler, 2006). On the other hand, innovation quality is defined as the performance of processes involved in innovation and their end results (Haner, 2002). In line with previous research (e.g. Wang et al., 2016; Wang & Wang, 2012), innovation speed and quality can prove to be a crucial mechanism in translating the impact of KM processes on performance of universities. However, the corporate-level experience of innovation speed and quality as a mediator in the relationship of KM processes and performance of universities is still blurred in the existing literature. Likewise, researchers also assert that KM capability of an organization i.e. ability to acquire, share and utilize knowledge positively affect IC that lead to enhanced OP (e.g. Ramadan, Dahiyat, Bontis & Al-dalahmeh, 2017; Asiaei & Jusoh, 2015). IC, which is frequently categorized into human, structural and relational capital (e.g. Andreeva & Garanina, 2016; Asiaei and Jusoh, 2015; Chahal & Bakshi, 2015), refers to stock of knowledge, professional skills and experience, customer relationships and organizational technology that contribute to value creation and provide competitive edge to an organization (Edvinsson and Malone, 1997). The existing literature shows substantial studies that have investigated the relationship between KM and IC (e.g. Seleim & Khalil, 2011; Shih, Chang & Lin, 2010) and the association between IC and OP (e.g. Andreeva & Garanina, 2016; Sharabati. et. al, 2010). Nevertheless, all these studies have been conducted in a corporate environment. Despite the increasing significance of IC (i.e. human, structural and relational) in research institutions and universities (Ramírez-Córcoles & Manzaneque-Lizano, 2015), its role in enhancing OP is infrequently discussed in the educational literature (Bratianu & Bejinaru, 2017; Chatterji & Kiran, 2017). Particularly, the aspect how IC (i.e. human, structural and

relational) translates the effects of KM into the performance of research universities is almost ignored in extant research. In sum, there is a dearth of studies that investigate the mediating role of innovation and IC in the relationship of KM and performance of HEIs or universities.

Higher education or university sector can play a pivotal role in economic and societal development of developing countries, as the case with Pakistan. Therefore, this research intends to bridge the highlighted knowledge gaps and aims at making several theoretical and practical contributions to the existing body of literature by empirically investigating the nexus of KM enablers, KM processes, innovation, IC, and OP in universities of Pakistan. More specifically, this study strives to address the following research questions:

RQ1. What impacts do KM enablers i.e. leadership, culture, and incentives have on KM processes i.e. knowledge acquisition, sharing, and utilization in universities of Pakistan?

RQ2. Is there a direct impact of KM processes on OP in universities of Pakistan?

RQ3. Does innovation (i.e. speed and quality) and IC (i.e. human, structural and relational) mediate the relationship between KM processes and OP in universities of Pakistan?

Consistent with its objectives, this paper is structured as follows: first, a review of the literature is presented about KM enablers, KM processes, IC, innovation, and OP. Next, hypotheses are stated, and research framework is developed. Afterward, a research methodology that covers sampling, data collection, measures and data analysis procedure is explained. Then, results, discussion, conclusion, and practical implications are provided. Finally, limitations of the study and directions for future research complete the paper.

2. Literature review

2.1 Knowledge and Knowledge Management

Recent studies conducted in the sphere of KM have recognized this century as an era of knowledge and information, where knowledge is being considered as a crucial organizational asset (Obeidat et. al., 2016). According to Shahzad et al. (2016), knowledge can be interpreted in terms of information, insights, ideas, skills, expertise, and experience. However, they further argue that the mere existence of knowledge in an organization cannot guarantee organizational success and sustained competitive advantage unless it is managed effectively through a proper system. Palacios, Gil, and Garrigos (2008, p. 292) defined KM as "a management tool

characterized by a set of principles along with a series of practices and techniques through which the principles are introduced, the aim of which is to create, convert, disseminate and utilize knowledge. KM also refers to an approach to formalize knowledge, expertise, and experience that generates new competencies leading towards enhanced OP through innovation, and customer satisfaction (Gloet & Terziovski, 2004; Gold et al., 2001). Ramachandran, Chong, and Wong (2013) defined KM as a purposeful and organized implementation of knowledge practices supported by strategic enablers.

2.2   KM Enablers

In organizations, KM activities do not spring up in isolation. There are certain organizational factors that help KM initiatives and facilitate knowledge related activities (Alaarj, Abidin-Mohamed, & Bustamam, 2016). In the existing literature, these factors have been discussed and recognized as KM enablers (Ho, 2009). In recent studies, most frequently investigated KM enablers include leadership, top management support, organizational HR practices, culture, structure, climate, and technology (Koohang, Paliszkiewicz, & Goluchowski, 2017; Masa'deh et al., 2016; Ahmed et al., 2015; Al-Hakim & Hassan, 2016). However, in accordance with recent calls (e.g. Muqadas et al., 2017; Fullwood, Rowley, & Delbridge, 2013; Ramachandran et al., 2013), this study intends to investigate the facilitative impact of three prominent factors i.e. leadership, culture and incentives on KM processes in a research university environment.

In the context of KM, leadership is regarded as the ability of an organization to configure KM behaviors with organizational strategy, identify knowledge opportunities, encourage KM values and promote learning in the organization (Koohang et al., 2017). Efficient and effective leadership, through the creation of a positive relationships and trustworthy environment, can provide a solid basis for knowledge activities leading to employee job satisfaction and organizational superiority (Paliszkiewicz, Koohang, Gołuchowski, & Horn Nord, 2015). Similarly, Muqadas et al., (2017) and Tan and Md Noor (2013) emphasized the importance of leadership or top management support to encourage knowledge to share culture and research collaboration in universities. Organizational culture, in KM perspective, is an interwoven pattern of employee's behavior and defined as a complex set of human values and attitudes that facilitate knowledge sharing (Ho, 2009). Knowledge-based culture is a major antecedent of KM activities and describes the extent to which knowledge is viewed as valuable resource and asset by employees (Mills & Smith, 2011; Chang & Chuang; 2011). For research universities, knowledge-friendly culture is an important organizational factor to promote knowledge processes or practices (Muqadas, et al., 2017).

Organizational incentives, on the other hand, are regarded as a reflection of worth that an organization gives to their knowledge employees (Cabrera & Bonache, 1999). Muqadas et al. (2017) suggested for the management of HEIs such as research universities to introduce a reward and recognition system that promote innovation and knowledge sharing. Academics tend to engage in a relationship with their colleagues and knowledge sharing activities when they expect an opportunity for promotion and career development (Fullwood et al., 2013; Cheng, Ho, & Lao, 2009).

2.3   KM Processes

In the field of KM, KM processes have been considered as systematic activities and given immense importance by the researchers in terms of organizational capabilities (Alaarj et al., 2016; Chang & Chuang, 2011; Darroch, 2005). Chang and Chuang (2011) define KM process capability as the extent to which an organization creates or acquire, shares, and utilizes knowledge. The process of knowledge sharing has been widely studied by the researchers in universities perspective (e.g. Tan & Md Noor, 2013), but empirical evidence about knowledge acquisition and utilization is still vague in the educational context. Thus, the current study will investigate three processes of KM: acquisition, sharing, and utilization.

Knowledge acquisition or capturing is the foremost and essential process of KM and has been argued to be one of the most complex and expensive processes (Obeidat et al., 2016). Knowledge acquisition refers to the process or activity for generation or creation and development of new ideas, knowledge, and skills that increase existing stock of organizational knowledge (Choo, 2003; Holsapple & Singh, 2001; Tiwana, 1999). According to Chiu and Chen (2016), knowledge acquisition is the result of employees' participation and interaction of people, resources, and technology. On the other hand, knowledge sharing, as an organizational belief, behavior, culture or network, refers to exchange or diffusion of learning, knowledge, skills, and experience among people or departments of the organization (Gharakhani & Mousakhani, 2012). Knowledge sharing can also be defined as a mechanism that facilitates dissemination of knowledge within the organization (Yang, Lai, & Yu, 2006). The process of knowledge sharing is of greater importance in universities to promote research collaboration among academics (Tan & Md. Noor, 2013). Knowledge utilization is characterized by knowledge storage, retrieval, application and donation (Gold et al., 2001) and defined as an activity to apply and exploit knowledge to the operations of business, products, and services to achieve superior OP (Lee, Cheng, Yeung, & Lai, 2011). Knowledge utilization includes operational, technological and social facets (Pasha and Pasha, 2008) and refers to the

application of knowledge to organizational functions, processes, and procedures to create commercial value for customers in the form of superior products and services (Azzam, 2010).

2.4   Intellectual Capital

Based on KBV theory, IC has proved to be an interesting theoretical concern for researchers (Wang et al., 2016). IC is defined as the combination of knowledge related resources, a wealth of ideas, capabilities, and infrastructure that determine the competitive ability of an organization (Sharabati, Jawad, & Bontis, 2010). In research universities' perspective, researchers, students, and managers along with their organizational processes and a network of relationships compose IC of a university (Warden, 2004). Regardless of the existing variations in the definitions of IC, researchers are agreed upon the framework of IC that encompasses three main components: human capital, structural capital and relational capital (Wang et al., 2016; Jardon, 2015). Following Ramírez-Córcoles and Manzaneque-Lizano (2015), this study will focus on these common components of IC: human, structural and relational to investigate their role in a university context.

Human capital, being a central component, serves as a driver for structural and relational aspects of IC (Li & Chang, 2010). According to Chahal and Bakshi (2015), human capital is the ability of an organization to create value through the use of experience, learning, skills, education, proficiency, the creativity of its employees. Contrary to the human aspect of IC, structural capital is an organizational infrastructure in terms of processes and procedures that extend support to working of employees (Chahal & Bakshi, 2015). and can also be treated as an intangible strategic asset that may take the form of organization's competencies, culture, norms, routines, values, databases, corporate image, trademarks, copyrights and so on (Aramburu & Saenz, 2011; Zangoueinezhad & Moshabaki, 2009). Furthermore, relational capital is concerned with the knowledge and learning abilities that result not only from the relationships between employees of an organization and its stakeholders but also from other relational resources such as customer loyalty, brand, and reputation (Agostini, Nosella, & Filippini, 2017).

2.5   Innovation

Innovation is one of the critical organizational elements that have strong effects on outcome of organizations and can be defined as an organization's propensity to apply new ideas, inventions and discoveries that result in development of new products or services, managerial strategy, procedures, work methods and technology (Chahal & Bakshi, 2015; Ruiz-Jime'nez & Fuentes-

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Fuentes, 2013). As discussed by Al-Hakim and Hassan (2016), innovation may be categorized into radical and incremental, technological and administrative innovation. However, researchers now recognize that innovation speed and innovation quality are more critical for organizations in a complex and frequently changing business environment. This research follows the conceptualization of Wang et al., (2016) and will focus on innovation speed and quality.

Innovation speed is the rate at which innovation proceeds from idea generation to ultimate commercialization and an organization's capability to accelerate the creation of new processes or products as compared to its competitors (Wang et al., 2016; Allocca & Kessler, 2006). According to Slater and Mohr (2006), innovation speed is a team-based competence that facilitates an organization to respond to customer needs quickly. However, in research university context, this study defines innovation speed as the capability to introduce new academic programs, curriculums, teaching methods and the like sharply to meet the challenges in a turbulent and complex economic and technological environment. On the other hand, quality of innovation is concerned with process and end results of the innovation (Haner, 2002). Quality of innovation can be measured through value-addition to the customer, features, cost, reliability, and flexibility of the product and service and effectiveness of processes (Wang & Wang, 2012; Haner; 2002). In the perspective of research universities, innovation quality can be termed as the ability to offer innovative educational services that are not only better than its competitors but also well integrated with social, economic and global needs.

2.6   Organizational Performance

OP being dependent or criterion variable in the sphere of management has been one of the most investigated variables to measure organizational success. Particularly, there is increasing emphasis on improving the operations of knowledge-based institutions. According to Koohang et al. (2017), OP indicates progress and development of an organization. Ngah and Ibrahim (2010) defined OP as "comparing the expected results with the actual ones, investigating deviations from plans, assessing individual performance and examining progress made towards meeting the targeted objectives" (p. 503). Researchers such as Akhavan, Ramezan, Moghaddam, and Mehralian (2014) argue that while measuring the performance of an organization, its objectives must be taken into account. Accordingly, in order to examine organizational performance in research universities' context, this study considers the indicators of customer satisfaction, curriculum development, responsiveness, research productivity and research ranking.

3.   Hypothesis development and research framework

This study mainly borrows theoretical foundations from Gold et al.'s (2001) KM capability model and Grant's (1996) KBV that are most widely cited in KM literature. Gold et al. (2001) proposed two realms of KM capability: knowledge infrastructure capability and knowledge process capability. In this model, knowledge infrastructure capability comprises enabling factors: structure, culture, and technology, whereas knowledge process capability is composed of knowledge acquisition, conversion, application and protection. As validated by a large number of previous studies (e.g. Cho & Korte, 2014; Chang & Chuang, 2011; Ho, 2009), this framework of KM capabilities suggests that knowledge infrastructure capability not only independently influence organizational effectiveness but also provides an enabling environment that facilitates or support KM processes which in turn improve OP. On the other hand, according to KBV, which primarily originates from resource-based view of the firm, an organization is constituent of knowledge resources that are valuable, inimitable and rare in nature (Grant, 1996). KBV further postulates that knowledge is an important strategic asset and primary source of value and sustainable competitive advantage for organizations (Seleim & Khalil, 2007; Bontis, 1999; Grant, 1996). Therefore, only those organizations that effectively and efficiently manage their knowledge and intellect would achieve superior performance (Zack et al., 2009) through increased innovation (Darroch, 2005) and/or accumulation of IC (Wang et al., 2014). Drawing upon these prominent theoretical perspectives, this research proposes an integrated model to examine the relationship between KM enablers, KM processes, IC, innovation, and OP.

3.1   KM Enablers and KM Processes

Successful accomplishment of KM activities in organizations inevitably requires an enabling environment (Cho & Korte, 2014). Based on Gold et al.'s (2001) KM capability framework, Ho (2009) contends that the enablers like leadership, culture, and incentives provide a mechanism that removes the impediments to knowledge development, encourages KM initiatives and facilitates employees to share and utilize their knowledge, skills and experience. For instance, adequate support from top management or leadership of the organization is the most important key factor for successful execution of KM projects (Davenport, De Long, & Beers, 1998). Leadership inspires employees to acquire, transfer and apply knowledge for innovative performance (Lopez & Esteves, 2013; Mushtaq & Bokhari, 2011). A large number

of studies have found significant direct and the indirect association between leadership and knowledge related activities (e.g. Koohang et al., 2017; Obeidat et al., 2016). Similarly, organizational culture is also an important factor that may impede or facilitate KM activities and their successful outcomes (Chang, Liao & Wu, 2017; Chang & Chuang, 2011). Knowledge friendly culture enables the organization to promote knowledge values and build a collaborative and interactive environment that ease knowledge creation, knowledge sharing among members and its application towards organizational outcome (Mills & Smith, 2011; Gold et al., 2001). Maintaining a knowledge-friendly leadership and culture is not the only panacea to successful KM. An organizational structure that adopts a standardized incentive system can assist KM initiatives (Ho, 2009; Gold et al., 2001; Davenport et al., 1998; Nonaka & Takeuchi, 1995). Although, Bock, Zmud, Kim, and Lee (2005) did not find sufficient evidence for extrinsic rewards to support knowledge related activities, however, a large number of researchers contend that incentives can motivate employees to acquire, sharing and apply knowledge (e.g. Cho & Korte, 2014; Fullwood et al., 2013). This theoretical deliberation along with existing empirical evidence leads to the following hypothesis:

> *H1*:   KM enablers (leadership, culture, and incentives) have significant and positive effect on KM processes (acquisition, sharing, and utilization).

3.2   KM Processes and OP

Given that organizations are frequently confronting rapid changes in business environment, knowledge is being considered as a strategic asset for sustaining competitive advantage and organizational success (Masa'deh et al., 2016; Shahzad et al., 2016). KM is equally important in HEIs such as research universities due to its potential contribution to their performance (Ma'sadeh, et al., 2017). However, as postulated by KBV (Grant, 1996), effective management of knowledge-based resources and successful implementation of KM processes is necessary to attain superior OP (Mazdeh & Hesamamiri, 2014). For instance, knowledge acquisition, sharing and utilization not only improve organizational collective learning and decision making but also enhance productivity and profitability through innovative ideas and novelty in products and services (Chiu & Chen; 2016; Masa'deh et al., 2016). Particularly, knowledge sharing helps to improve research performance in universities (Ismail, Welch, & Xu, 2015). A large number of recent studies have revealed a significant, positive and direct association between KM processes and OP (Chiu & Chen; 2016; Ngah et. al., 2016; Shahzad et. al., 2016). Additionally, Ahmed et al. (2015) confirmed positive and direct association between KM processes and performance of universities. Accordingly, the following hypothesis is proposed:

> *H2*:   KM processes have significant positive and direct effects on OP.

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3.3   KM Processes, IC and Organization Performance

Drawing on KBV, existing research purports that KM and IC are the two critical sources of organizational competitive advantage and performance (e.g. Kianto, Ritala, Spender, & Vanhala, 2014; Mills & Smith, 2011; Shih et al., 2010). KBV scholars further assert that KM and IC are closely connected (Seleim & Khalil, 2011; Serenko, Bontis, Booker, Sadeddin, & Hardie, 2010; Serenko & Bontis, 2004) and when fitted together in an organizational strategy they can bring forward desirable performance outcomes (Wang, Wang, Cao, & Ye, 2016; Kianto et al., 2014). Therefore, a significant body of literature has recognized the role of KM processes in the development of IC (Ramadan et al., 2017; Andreeva & Kianto, 2011; Gold et al., 2001; Bontis, 1999). For example, knowledge acquisition that refers to the process of accumulation of new knowledge and revamping of existing knowledge through external resources is critical for developing human capital such as improving skills, competencies and cognitive abilities of employees (Seleim & Khalil, 2011). Moreover, creating and maintaining a knowledge network and relationship with external organizational stakeholders: suppliers, competitors, customers and the others, helps organizations to enhance their stock of relational capital (Dahiyat & Al-Zu'bi, 2012; Seleim & Khalil, 2011; Gold et al., 2001). The acquired knowledge is futile if not disseminated to or shared with other members of the organization. Knowledge sharing or transfer that facilitates the creation of new knowledge and skills is, therefore, equally important to build human capital (Reychav & Weisberg, 2010; Nonaka, Krogh, & Voelpel, 2006). Sharing of knowledge, talent and experience may be both formal and informal such as interdepartmental task forces, employee interactions, training events, conferences, informal social networks and the like (Holste & Fields, 2010). Such type of knowledge sharing not only creates new knowledge and skills but also develops new cultures, routines, processes and policies, problem-solving techniques and promote decision making that represents the structural capital of an organization (Wang, Wang, & Liang, 2014). Similarly, when shared with members and stakeholders of the organization, knowledge helps to promote relational capital (Dahiyat & Al-Zu'bi, 2012). Knowledge utilization or application designates the ultimate benefits of KM processes in terms of improved customer value and competitive advantage (Dahiyat, 2015). Like knowledge sharing, effective utilization of knowledge also results in new knowledge, new skills, new products and services thus promoting human, relational and structural dimensions of IC (Seleim & Khalil, 2007).

On the other hand, a plenty of empirical research has asserted a positive association between them IC and organizational outcomes (e.g. Buenechea-Elberdin, Sáenz, & Kianto,

2017; Wang et al., 2016). For instance, effective decision-making abilities and excellent problem-solving skills that represent human capital can result in increased productivity and process quality leading to enhanced OP (Campbell, Coff, & Kryscynski, 2012). Similarly, incorporation of structural capital (e.g. improved processes and work procedures, effective communicational channels, innovative culture, employee commitment) in business operations can decrease cost, enhance responsiveness and improve quality of operations and products or services that ultimately results in increased OP (Aramburu & Saenz, 2011; Zangoueinezhad & Moshabaki, 2009). On the other hand, relational capital derived from a strategic relationship with external stakeholders can assist organizations to learn innovative ways of business, builds cognitive capacity, promote inter-firm learning (Wang et al., 2014; Hsu & Wang, 2012). Summing up, recent empirical studies such as Andreeva and Garanina (2016) and Asiaei and Jusoh (2015) have also concluded significant positive association between components of IC and OP, particularly, Chatterji and Kiran (2017) found the important role of IC in enhancing the performance of universities.

Furthermore, KBV suggests that ability of an organization to create value largely hinges upon its ability to acquire or create, share and utilize knowledge (Martelo-Landroguez & Cepeda-Carrión, 2016) thus creating a source of organizational competence in terms of improved skills, abilities and proficiency (Chahal & Bakshi, 2015). Hsu (2008) also concluded that KM processes, knowledge sharing, in particular, increase OP through the development of human capital and structural capital. Similarly, Wang et al. (2016) found the mediating role of IC in the relationship of Knowledge sharing and OP. Following these lines of logic regarding the relationship of KM processes, IC and OP in the corporate sector, we propose the following hypothesis in research university context:

H3:   KM processes have significant and positive effect on IC (human, structural
        and relational).

H4:   IC has significant and positive effect on OP.

H5:   IC has mediating effect on the relationship between KM processes and
        OP.

3.4   KM Processes, Innovation, and OP

Application of KBV in existing research deduces a universal positive linkage between KM and innovation capability and performance (e.g. Lee, Leong, Hew, & Ooi, 2013; Andreeva & Kianto, 2011; Du Plessis, 2007). For instance, according to Obiedat et al., (2016), innovation

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capability of an organization is centered upon its knowledge and skills obtained not only from internal resources but also through the interaction with its external stakeholders. Similarly, adoption of KM processes such as knowledge acquisition and utilization can also result in improved innovation and business performance (Inkenin, 2016; Shang, Lin, & Wu, 2009). Huang and Li (2009) argue that through the process of knowledge sharing and utilization, organizations can promote innovativeness in their products, services, and processes. A large number of empirical studies have shown the positive impact of KM processes on innovation (e.g. Obiedat et al., 2016; Al-Hakim & Hassan, 2016; Darroch, 2005). Moreover, both innovation speed and quality are critical to innovation performance and various research findings show significant positive effects of KM processes, knowledge sharing in particular, on both of the aspects of innovation (Wang et al., 2016; Wang & Wang, 2012).

Regarding the relationship between innovation and OP, Ruiz-Jime´nez and Fuentes-Fuentes (2013) consider innovation as a critical enabler for the superior OP and sustained competitive advantage in rapidly changing and complex business environment. The extant empirical research at large indicates how innovation leads to OP. According to Sadikoglu and Zehir (2010), innovativeness can facilitate organizations to enhance their managerial capabilities that result in efficient and prompt response to environmental changes leading to increased OP. Likewise, Alipour and Karimi (2011) argue that innovative firms are in a better position to fulfill the changing demands of their customers that result in higher business efficiency. Moreover, in the context of OP, both innovation speed and innovation quality are important (Wang & Wang, 2012). Innovation speed can help a firm to improve their operational efficiency and service quality (Liao, Wang, Chuang, Shih, & Liu, 2010) and introduce new products or services in minimum time and at a lower cost than its competitors resulting in enhanced OP (Tidd, Bessant & Pavitt, 2005). Similarly, quality of innovation can also lead to increased performance through novelty in ideas, research, and development activities (Singh, 2008).

As underscored by Shujahat, Ali, Nawaz, Durst, and Kianto (2018), one of the key propositions of KBV is that effective management of knowledge resources increase innovation which in turn augment OP. This theoretical reasoning suggests mediating role of innovation between the relationship of KM and OP as indicated by previous empirical investigations. For instance, acquisition and sharing of knowledge not only enhance decision making and learning abilities of an organization but also productivity and profitability through creative ideas and uniqueness in products and services (Chiu & Chen; 2016; Masa'deh et al., 2016). Recently, Al-Hakim and Hassan (2016) noted a partial mediation effect of innovation on the relationship

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between KM processes and OP in the context of the Iraqi telecom sector. Particularly, Wang et al. (2016) and Wang and Wang (2012) concluded a significant mediation of innovation speed and quality between the relationship between knowledge sharing and firm performance. Apropos to the experienced interaction of KM processes, innovation and OP in a corporate environment, the following hypotheses are drawn in the context of research university:

H6:   KM processes have significant and positive effect on innovation (speed and quality).

H7:   Innovation has significant and positive effect on OP.

H8:   Innovation has mediating effect on the relationship between KM processes and OP.

Figure-1 Here

3.   Methodology
3.1   Research universities

In knowledge-based economies, universities play a crucial role in the economic and social development of a country through research activities and innovative ideas as witnessed by developed nations. Therefore, research activities should be central to universities in developing countries like Pakistan. In line with the experience of developed countries, the Higher Education Commission of Pakistan (HEC) has an extended focus on promoting research culture leading towards research activities at universities (Noreen & Adeeb, 2014). However, despite the initiatives taken by HECP, research activities are still inadequate in universities for which an effective KM is inevitable to meet the challenges of a knowledge-based economy (Yasir et al., 2017). In this research, we intend to relate KM and organizational performance of research universities in Pakistan.

3.1   Population, Sample and Data collection

The target population for this study consisted of the academic staff and administration personnel of public sector research universities in Federal capital of Pakistan that are engaged in advancing multi-disciplinary education and research in natural and social sciences, technology, and engineering. A survey questionnaire was employed to collect data for the testing of hypothesized relationships as shown in Fig. 1. 325 questionnaires were distributed through convenience sampling technique which is a fast and inexpensive way of data collection

and commonly applied in social and business studies. A total number of 241 questionnaires were received back reflecting a response rate of 67%. After discarding 24 incomplete or invalid surveys, 217 questionnaires were retained for statistical analysis. Taking into account the complexity of the proposed research model, this sample size is fairly sufficient for use of Structural Equation Model (SEM) to analyze the complicated path model as suggested by Kline (2010).

3.2   Measures

In the present study, all of the 62 measurements items were borrowed from existing research. However, little modifications were made in the wording of the items to align them with a university context. The questionnaire employed a five-point Likert scale ranging from "1" meaning "strongly disagree" to "5" meaning "strongly agree". Sources of measurement instruments are reflected in Table-I.

Table-I Here

3.3   Data Analysis Procedure

This study is quantitative in nature and adopts a cross-sectional research design. Using the SmartPLS 2.0 software package (Ringle, Wende, & Will, 2005), Partial least squares-structural equation modeling (PLS-SEM) technique was employed to analyze the data. PLS-SEM is an emerging data analysis tool in business, management, and social sciences research and used to better handle small sample size and non-normal data (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). This technique is more appropriate when research aims at testing existing theories and involves complex model structures (Ringle, Sarstedt, Mitchell, & Gudergan, 2018; Fernandes, 2012). PLS-SEM involves two stages of analysis: measurement model specification and structural model evaluation (Ringle et al., 2018; Wong, 2013). Measurement model specification assures that only the constructs having good indicator loading, convergent validity, composite reliability and discriminant validity will be used in the structural model. Structural model evaluation is meant for assessing path coefficients and testing their significance through bootstrapping technique. Regarding mediation analysis, Preacher and Hayes's (2008) approach was followed as it is the more rigorous procedure to test mediating effects and more suitable to use with PLS-SEM technique (Hair, Hult, Ringle, & Sarstedt, 2013;

Hayes, 2009). Most of the recent empirical studies in KM field have employed PLS-SEM tool for data analysis (e.g. Shujahat et al., 2018; Valaei et al., 2017; Wang et al., 2016).

4.   Data analysis and results

4.1   Measurement Model Assessment

In the first stage, assessment of measurement model was made in accordance with the suggestions of Hair, Black, Babin, Anderson, and Thatham (2006) to confirm reliability and validity of the constructs and their dimensions. Initially, 62 indicators were included in the model. While analyzing the measurement model, the indicators having low factor loading were removed and the model was re-run until all the factor loading were above or closed to the recommended value of 0.60. However, in line with the guidelines of Hair et al. (2013), care was taken not to remove the items that were theoretically important, and their removal had no increasing effect on AVE and composite reliability. Consequently, 40 items were included in the final measurement model. Table-II indicates that all factor loadings are greater than the recommended value of 0.60. Similarly, the average variance extracted (AVE) and composite reliability (CR) of all the constructs are equal to or exceed recommended values of 0.50 and 0.70 respectively. Thus, convergent validity and reliability are established. Moreover, as shown in Table-III, discriminant validity is also confirmed according to the criterion suggested by Fornell and Larcker (1981). The overall results of confirmatory factor analysis indicate that the model is adequate for structural evaluation.

Table-II Here

4.2   Structural Model Assessment

After mandatory assessment of measurement model, analysis of structural model was performed in the second stage. The hypotheses were tested in a series of steps. Firstly, the direct effects of KM enablers on the KM processes were examined. In the second step, the direct effects of KM processes on innovation, IC and OP were tested. Then the direct effects of innovation and IC on OP were examined. Bootstrap resampling method with 5,000 resamples (Ringle et al., 2005) was used to determine the significance of direct paths and estimate standard errors. Table-IV lists the test results of hypotheses proposed for direct relationships. Finally, the effects of KM processes on OP, through the mediation of innovation and IC were tested. Table-V shows the results of the mediation analysis.

Table-III Here

According to Table V, there is a significant positive effect of KM enablers on KM processes (β = .669, p < .001). Therefore, H1 is supported. Similarly, there is significant positive and direct effect of KM processes on OP (β = .624, p < .001), IC (β = .688, p < .001) and innovation (β = .643, p < .001). These results support H2, H3 and H6. The results also acknowledge the significant direct and positive effect of IC (β = .319, p < .001) and innovation (β = .483, p < .001) on OP. Therefore, H4 and H7 are accepted.

Table-IV Here

To examine the mediation of IC and innovation, Preacher and Hayes's (2008) method was applied and p-values for indirect effects were obtained through bootstrapping with 500 resamples (Ringle et al., 2005). The results indicate that there is significant indirect effect of KM processes on OP through the mediation of IC (β = .278, p < .001) and innovation (β = .320, p < .001). This finding supports H5 and H8.

Table-V Here

5. Discussion, conclusion and practical implications

The current study aimed to examine: a) influence of KM enablers on KM processes, b) direct influence of KM processes on OP, c) mediating effect of IC and innovation in the relationship between KM processes and OP in research universities. The hypothesized relationships were tested using PLS-SEM technique. Findings of this research contribute to the literature in a variety of way. Firstly, this study sheds light on the inevitability of KM enablers namely leadership, culture and incentives to facilitate knowledge related activities in a research university. Results of the study demonstrate that these enablers significantly and positively affect processes of knowledge acquisition, sharing, and utilization. Interestingly, these results contradict findings of Fullwood et al. (2013), Tan and Md Noor (2013) and Taminiau, Smit, and Lange (2009) who did not find any significant impact of top management support and incentives on KM processes. However, findings of this research validate Gold et al.'s (2001) KM capability model and most of the previous studies (e.g. Valaei et al., 2017; Cho & Korte, 2014; Ramachandran et al., 2013; Ho, 2009). These researchers noted organizational

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leadership, culture, and incentives or rewards as critical factors for successful implementation of KM processes. For instance, when organizational leadership promote KM values, set up clear goals and formulate robust KM strategies, they can successfully implement KM processes (Donate & de Pablo, 2015; Ho, 2009; Wei et al., 2009). On the other hand, the existence of a knowledge-friendly organizational culture in terms of norms, beliefs, attitudes, and behaviors is also conducive to KM effectiveness (Valaei et al., 2017; Mills & Smith, 2011; Zheng, Yang, & McLean, 2010). An organizational culture that is characterized by collaboration, learning, openness, and trust can stimulate knowledge creation and exchange (Lee & Choi, 2003) leading towards successful KM (Chang & Chuang, 2011; Ho, 2009). In a similar vein, organizations that incorporate a standardized incentive system can better institutionalize KM behaviors (Cho & Korte, 2014; Ho, 2009; Lin, 2007).

Second, the current research found that effective implementation of KM processes is significantly instrumental to the performance of research universities. This finding reveals that effective implementation of KM processes in research universities can lead to increased research productivity, student satisfaction, curriculum development and responsiveness to the environmental challenges. These results also suggest the equal validity of KBV in HEIs context by being in line with the key proposition of KBV that effective management of knowledge resources can facilitate organizations to achieve superior performance. Similarly, this research maintains the importance of KM in HEIs as primarily highlighted by Rowley (2000) and corroborates findings of Ahmed et al. (2015) who conducted a study in universities' context and concluded a significant positive and direct relationship between KM processes and OP. Additionally, this study supports the argument of Shahzad et al. (2016) that efforts of an organization revolve around its performance and effective implementation of KM processes can be a vital source of the higher OP and sustainable competitive advantage.

Finally, findings of this study provide important empirical insight into the indirect influence of KM processes on OP through the mediation of IC and innovation. The results show that KM processes significantly and positively affect components of IC that in turn enhance the performance of universities. These results are consistent with the findings of recent research conducted by Ramadan et al. (2017), Andreeva and Garanina (2016) and Asiaei and Jusoh (2015) in the corporate sector. On the whole, the findings of this research implies that KM processes: knowledge acquisition or creation, knowledge sharing and knowledge utilization or application facilitate development of IC in terms of increased knowledge networks and group learning and improved organizational procedures, routines, operations, skills and competencies and individuals' cognitive attitudes (Seleim & Khalil, 2011; Shih et al., 2010; Gold et al., 2001;

Grant, 1996). This accumulated IC, in turn, plays an important role in enhancing organizational competitive advantage and performance as testified by previous studies (e.g. Chatterji & Kiran, 2017; Wang et al., 2016; Wang et al., 2014; Sharabati et al., 2010; Zangoueinezhad & Moshabaki, 2009). Similarly, findings of the current study reveal significant positive and indirect effect of KM processes on OP through innovation speed and quality thus validating KBV theory. In earlier research, only the process of knowledge sharing has been indirectly linked to OP through innovation speed and quality (e.g. Wang et al., 2016; Wang & Wang, 2012). The empirical findings of this research suggest that not only knowledge sharing but also knowledge acquisition and utilization can improve innovation speed and quality resulting in the superior OP.

In conclusion, the current study contributes to the KM literature by highlighting key KM enablers to facilitate KM processes. The findings of this research render that leadership support, organizational culture and incentives are mandatory for successful implementation of KM processes. Policy makers and administration of research universities should come up with a deliberate plan to provide a supportive leadership, create a collaborative culture and establish an incentive or reward system to encourage, shape and sustain KM processes among their employees (Muqadas et al. 2017; Rodríguez-Gómez & Gairín, 2015). For instance, leadership or top management must have a clear vision about KM in their university and share it with other members that KM processes are vital for individual and organizational performance (Tan, 2016). Additionally, there should be a well-focused strategic plan, a dedicated team, and the provision of adequate funding to support KM activities. On the hand, in research universities, knowledge culture can be fostered through recognition, openness, trust, communication (Yasir et al., 2017) and other activities such as frequent seminars, workshops, and mix and mingle opportunities (Tan, 2016). Similarly, management of universities should implement an incentive system well commensurate with knowledge acquisition, sharing, and utilization. Such an incentive system may further lead to research collaboration, contributing ideas and innovative solutions. Moreover, although previous research reveals some studies regarding the relationship between KM and organization performance in research universities (e.g. Ahmed et. al., 2015), yet mediating role of IC and innovation in this relationship is almost neglected. This research endeavor bridges this gap and is novel in a sense that it adds insights to KBV literature demonstrating that how KM processes contribute to the performance of universities through the mediation of IC and innovation speed and quality. Findings of this study exemplify that knowledge acquisition, sharing and utilization in research universities can promote its IC and foster innovation capability leading towards enhanced OP.

6. Limitations and future research directions

Besides its contribution to the literature, the present study has certain limitations that expose new avenues for future research. First, this study recruited a small size convenience sample from a limited number of public sector research universities, thus inviting sample bias and questioning generalizability of the results to other public sector as well as private sector universities or HEIs. In future studies, a larger size of sample drawn by adopting random sampling procedure across public and private HEIs or universities may facilitate researchers to generalize the results and better answer the research questions this study addressed. Similarly, a multi-group analysis of public and private sector universities would be interesting to compare KM effectiveness in public and private contexts and may entail more solid practical implications. Second, this study has been conducted in Pakistani context and its findings are not generalizable to other developing countries where HEIs might have different cultures and structures. It would be encouraging to replicate the current study in other developing countries and validate the findings concluded in this research. Third, only three KM enablers namely leadership, culture, and incentives were included in the research model. Researchers may consider other important factors such as perceived organizational support, openness in communication, trust, organizational commitment and the like that have been widely studied in the corporate sector but can also be equally critical in HEIs context. Lastly, in this study OP of the university has been measured in terms of customer satisfaction, quality development, responsiveness, research productivity and research ranking. Future research may engage other important indicators such as academic efficacy, graduation rate, graduate's employability, impact factor citations and university ranking for robust investigation.

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Figure 1.
The proposed
research model

Innovation
- Speed
- Quality

**KM
Enablers**
- Leadership
- Culture
- Incentives

**KM
Processes**
- Acquisition
- Sharing
- Utilization

**Organizational
Performance**

**Intellectual
Capital**
- Human
- Structural
- Relational
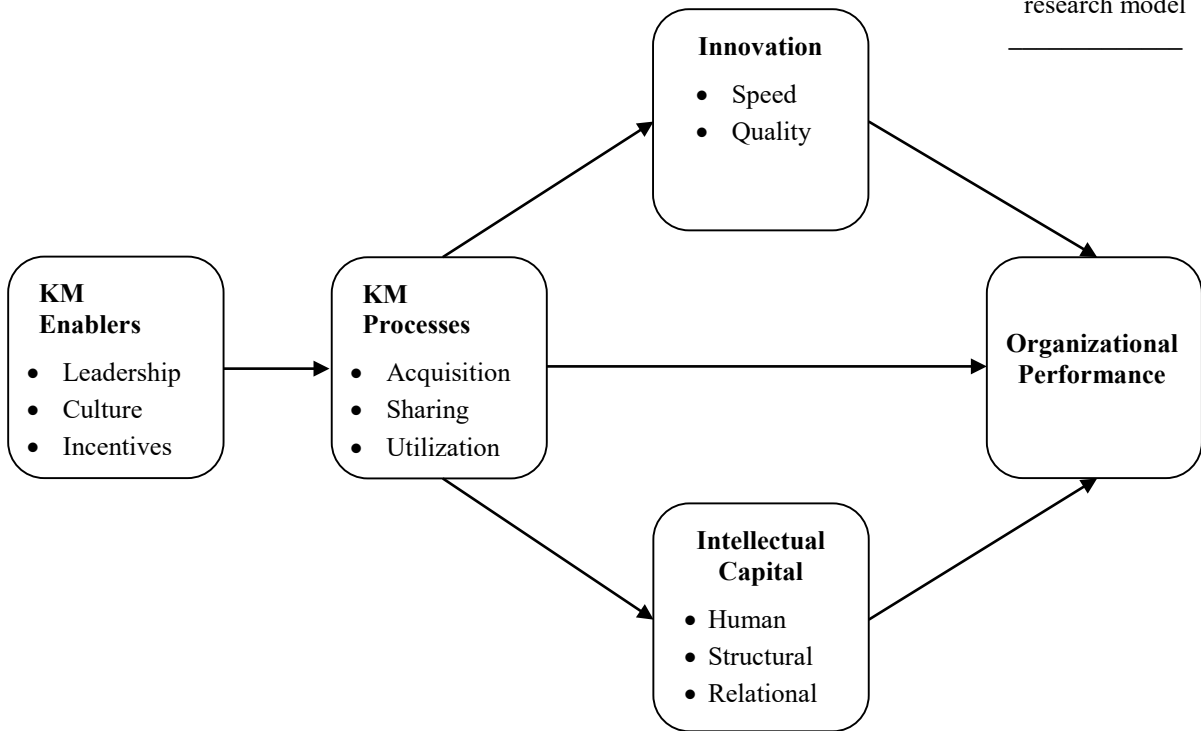
Table-I Sources of Measurement Instruments

Variable	Dimensions	No. of Items	Source
KM Enablers	Leadership (LS)	5	Wei, Choy, and Yew, (2009)
	Organizational Culture (OC)	5	Wei et al. (2009)
	Organizational Incentives (OI)	4	Lin (2007)
KM Processes	Knowledge Acquisition (KA)	6	Choo (2003), Huang and Li, (2009) and Azzam (2010)
	Knowledge Sharing (KS)	5	Lee et al. (2005) Huang and Li (2009)
	Knowledge Utilization (KU)	5	Lee et. al. (2005) Huang and Li (2009)
Intellectual Capital	Human Capital (HC)	5	Bontis (1998), Chen, Shih, & and Yang (2009), Hsu and Fang (2009) and Youndt et. al. (2004)
	Structural Capital (SC)	7	Bontis (1998), Hsu and Fang (2009) and Longo and Mura (2001)
	Relational Capital (HC)	5	Bontis (1998), Hsu and Fang (2009) and Wu, Chang, and Chen (2008)
Innovation	Innovation Speed (IS)	5	Wang and Wang (2012)
	Innovation Quality (IQ)	5	Wang and Wang (2012)
Organizational Performance		5	Wang and Wang (2012) and Wang (2010)

Table-II Convergent Validity and Reliability

Construct	Dimension	Item	Mean	SD	Loading	AVE	CR
KM Enablers	Leadership	LS1	3.30	1.07	0.89	0.54	0.77
		LS2	3.42	0.90	0.61		
		LS5	3.70	0.84	0.66		
	Organizational Culture	OC1	3.71	1.04	0.85	0.55	0.79
		OC3	3.68	0.96	0.73		
		OC4	3.69	0.91	0.64		
	Organizational Incentives	OI1	3.73	1.07	0.80	0.57	0.80
		OI2	3.71	0.95	0.71		
		OI4	3.71	1.02	0.75		
KM Processes	Knowledge Acquisition	KA1	3.25	0.99	0.65	0.56	0.79
		KA2	3.63	0.90	0.84		
		KA4	3.64	0.95	0.75		
	Knowledge Sharing	KS1	3.68	0.98	0.76	0.51	0.81
		KS2	3.66	0.86	0.67		
		KS3	3.83	0.97	0.68		
		KS4	3.64	1.01	0.75		
	Knowledge utilization	KU1	3.81	0.97	0.78	0.58	0.81
		KU2	3.59	0.85	0.77		
		KU5	3.94	0.97	0.74		
IC	Human Capital	HC1	3.82	0.99	0.76	0.59	0.81
		HC2	3.86	0.92	0.84		
		HC3	3.69	0.93	0.71		
	Structural Capital	SC1	3.65	1.07	0.80	0.53	0.77
		SC2	3.64	0.87	0.66		
		SC3	3.72	0.86	0.72		
	Relational Capital	RC1	3.84	0.95	0.81	0.53	0.77
		RC2	3.83	0.83	0.73		
		RC4	3.67	0.96	0.63		
Innovation	Innovation Speed	IS1	3.35	1.03	0.74	0.51	0.81
		IS2	3.66	0.88	0.76		
		IS3	3.74	0.90	0.75		
		IS4	3.66	0.96	0.60		
	Innovation Quality	IQ1	3.67	0.90	0.73	0.54	0.83
		IQ2	3.78	0.92	0.77		
		IQ3	3.83	0.95	0.75		
		IQ4	3.70	0.97	0.69		
Organizational Performance		OP1	3.72	1.02	0.71	0.50	0.80
		OP2	3.85	0.83	0.70		
		OP3	3.67	1.02	0.78		
		OP4	3.89	0.97	0.63		

Table-III Discriminant Validity (Fornell–Larcker criterion)

	HC	IQ	IS	KA	KS	KU	LS	OC	OI	OP	RC	SC
HC	**0.77**											
IQ	0.50	**0.74**										
IS	0.34	0.48	**0.71**									
KA	0.41	0.45	0.42	**0.75**								
KS	0.48	0.51	0.44	0.55	**0.71**							
KU	0.58	0.53	0.42	0.50	0.65	**0.76**						
LS	0.34	0.40	0.45	0.45	0.41	0.42	**0.73**					
OC	0.38	0.38	0.28	0.50	0.38	0.35	0.45	**0.74**				
OI	0.27	0.33	0.46	0.45	0.46	0.40	0.39	0.30	**0.75**			
OP	0.52	0.57	0.63	0.53	0.54	0.51	0.47	0.42	0.41	**0.71**		
RC	0.62	0.60	0.42	0.44	0.46	0.54	0.28	0.32	0.35	0.52	**0.73**	
SC	0.47	0.57	0.47	0.44	0.42	0.54	0.43	0.32	0.33	0.55	0.50	**0.73**

Note: The data on the diagonal (in bold) is the square root of AVE of the construct.

Table-IV Results of structural model path coefficient (direct relationships)

Hypothesis	Relationship	*B*	SE	t-value	Decision
H1	KMEs → KMPs	0.669	0.046	14.566*	Supported
H2	KMPs → OP	0.624	0.054	11.601*	Supported
H3	KMPs → IC	0.688	0.049	14.036*	Supported
H4	IC → OP	0.319	0.093	3.448*	Supported
H6	KMPs → Inno	0.643	0.043	14.916*	Supported
H7	Inno → OP	0.483	0.081	5.973*	Supported

Notes: *$p < 0.001$, KMEs = KM enablers, KMPs = KM processes, Inno = Innovation,
IC = Intellectual capital, OP = Organizational performance.

Table-V Summary of Mediation Results

Hypothesis	Indirect Path				Mediation effect β	t-value	Decision
	Path	β	Path	β			
H5	KMPs→IC	0.688	IC→OP	0.404	0.278	4.203*	Supported
H8	KMPs→Inno	0.637	Inno→OP	0.502	0.320	6.075*	Supported

Notes: *$p < 0.001$, bootstrapping ($n = 500$)