



The Relationship between Knowledge Management Practices and Technological Innovation: A Conceptual Framework

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This research paper aims to establish a conceptual framework that links the different dimensions of knowledge management, namely knowledge acquisition, knowledge dissemination and knowledge application, with innovation performance, particularly focusing on technological innovation (i. e. product and process innovation). This study seeks to benefit the top management team of any organization that desires to enhance and improve their level of technological innovation through the effective implementation of the relevant KM dimensions. The findings of this study conclude that the effectual use of knowledge management practices is believed to unlock the technological innovation of a firm.

Keywords: knowledge management, knowledge acquisition, knowledge dissemination, knowledge application, technological innovation, process innovation, product innovation

Introduction

Organizations today operate in a competitive and globalized business environment. In order to compete with their rivals, many organizations have turned to the use of Information Technologies (IT) to improve their business operations (Vaccaro, Parente, & Veloso, 2010). However, it is no longer sufficient for organizations to solely improve on their business operations and reduce costs (Chong, Chan, Ooi, & Sim, 2011). Organizations nowadays are increasingly focusing their attention on improving their innovation performances – new product performances or the ability of a company to develop new products/services as a response to market needs (Vaccaro et al., 2010). Innovation is one of the key business strategies for companies in the manufacturing industry. The manufacturing industries have traditionally competed on operating with lower costs. However, operating at a lower cost is not a long term sustainable business strategy (Chong & Ooi, 2008). Instead, organizations such as Apple Computers have shown that innovation is the way to move forward. Innovation in manufacturing companies has

been studied by past researchers such as Prajogo and Sohal (2003) and Singh and Smith (2004).

Given that the research on the topics of innovation is increasing, many researchers and practitioners are now looking at some ways in which organizations are able to improve their innovation performances. Past studies in the manufacturing sectors have focused on whether the implementation of Total Quality Management (TQM) practices is able to improve the innovation of organizations (Hoang, Igel, & Laosirihongthong, 2006; Lorente, Dewhurst, & Dale, 1999; Prajogo & Sohal, 2001, 2003; Singh & Smith, 2004; Lee, Ooi, Tan, & Chong, 2010). However, more recent studies have also focused on other operation management areas such as Supply Chain Management (SCM), and looked at whether a better SCM can lead to improved innovation performances. One key finding from Chong et al. (2011) revealed that it is the implementation of Information Technology (IT) tools in the SCM that have a significant relationship with the innovation performances of organizations. Cantner, Joel, and Schmidt (2009) also found that IT is able to facilitate innovations in organizations in the context of inter-firm collaborative relationships. Such collaborative relationship brought by IT is also proposed by Chong, Ooi, Lin, and Teh (2010). Knowledge Management (KM) tools are also one of the key IT tools that are able to improve organizations' innovation performances through increasing research and quality collaborations in companies, and facilitating the exchange of knowledge. The ability to share and store knowledge by KM tools provides the potentials to improve the innovation performances of organizations.

Although the idea of KM implementation and its influence on innovation performances of organizations have been proposed (Chong et al., 2010), there are limited empirical examinations that investigate the relationships between an organization's KM process and its innovation performance, in particular technological innovation (i. e. product and process innovation). Although Vaccaro et al. (2010) conducted an empirical examination on KM tools and innovation performance of organizations, their study focused on an organization's reliance on KM, and neglected the actual KM practices implemented by the organizations. Understanding this relationship will help organizations better plan their KM implementations which may improve their innovation performances. Furthermore, most studies on innovation performances have focused on product innovation, neglecting process innovation. Companies are now paying more attention to both product and process innovations, also known as technological innovation. The implementation of technological innovation is believed improve a company's competitive advantage (Chuang, 2005; Cooper, 1998; Damanpour & Gopalakrishnan, 2001). Therefore, it would be important to investigate technological innovation from the perspectives of both product and process innovations. In order

to bridge the gap in existing literatures, this study aims to examine the relationships between the KM processes implemented by organizations (e. g. knowledge acquisition, knowledge sharing and knowledge application), and their relationships with technological innovation (e. g. product and process innovations) of firms.

Literature Review

Knowledge Management

Ways of managing knowledge in the organization are very important for survival in today's competitive environment, and in that the concept of knowledge management is created. The term knowledge management is still vague, as revealed in the literature (Tiago, Couto, Tiago, & Vieira, 2007). Different researches have interpreted knowledge management differently as shown in Table I. According to Beckman (1999), definitions of knowledge management are very subjective. He further went on to relate knowledge management to experience.

Knowledge management is a process of managing information within the company for the company's gain (Roy, 2002). According to Wen (2009), knowledge management is creating, acquiring, sharing and utilizing knowledge in the organization to enhance performance. Darroch and McNaughton (2001) as cited in Darroch and McNaughton (2002, p. 11) defined knowledge management as

The management function that creates or locates knowledge, manages the flow of knowledge within the organization and ensures that the knowledge is used effectively and efficiently for the long term benefit of the organization.

Schulz and Jobe (2001) defined KM as the transformation of tacit to explicit knowledge to enhance the flow of organizational knowledge. Knowledge derived from human sources is circulated within the organization. Knowledge can be categorized as tacit knowledge and explicit knowledge according to Nonaka and Takeuchi (1995). Tacit knowledge serves as the base to develop organizational knowledge (Nonaka & Takeuchi, 1995) and cannot be easily explained; while explicit knowledge is structured in nature (Mårtensson, 2000). Explicit knowledge can be easily codified and communicated (Alavi & Leidner, 2001).

In this study, three most important processes consisting of knowledge acquisition, knowledge sharing and knowledge application will be the central element of the knowledge management process (Darroch & McNaughton, 2003; Liao & Wu, 2010). Lin and Lee (2005) revealed that these knowledge management processes are vital for the adoption of new technology. Furthermore, Becerra-Fernandez, Gonzalez, & Sabherwal (2004) share a

Table 1 Previous Literatures That Have Defined the Knowledge Management Process in Different Approaches

Past literatures	Definition
Awad and Ghaziri (2004)	Capturing, organizing, refining, transferring
Darroch and McNaughton (2003)	Knowledge acquisition, knowledge sharing, knowledge application
Shankar, Singh, Gupta, and Narain (2003)	Knowledge responsiveness, knowledge acquisition, knowledge dissemination, knowledge application
Hlupic, Pouloudi, and Rzevski (2002)	Knowledge generation, knowledge codification, knowledge transfer
Oluic-Vukovic (2001)	Gathering, organizing, refining, representing, dissemination
Schwartz and Te'eni (2000)	Acquisition, organization, distribution
Nonaka and Takuechi (1995)	Socialization, Externalization, Combination, Internalization

similar perception in which knowledge management and innovation is related, particularly process innovation. First of all, knowledge acquisition is important because gathering knowledge from suppliers, internal employees and customers remains the top priority for organizations to ensure continuous improvement. This accumulation of information can increase an organisation's understanding of their employees' skills and experiences, enabling the firm to better produce products that can meet customers' satisfaction (Yang, 2008). This step is particularly important as the knowledge of customers' needs and wants, which are in terms of tacit knowledge, can be accumulated, thus ensuring that quality assurance is met in every aspect.

Secondly, knowledge dissemination also plays an important role in the KM process. Employees' participation is believed to enhance the transformation of knowledge to organizational level, ensuring that quality is maintained within the organization (Yang, 2008). Primarily, organizational knowledge is acquired through individuals. Through the dissemination and transfer of knowledge, organizational capabilities can be developed (Kogut & Zander, 1993; Endres, Endres, Chowdhury, & Alam, 2007). Only when employees participate and contribute to the sharing of knowledge can the quality improvement in a firm be maximized (Hsu & Shen, 2005).

Lastly, knowledge application is facilitated by knowledge dissemination. The higher activity of knowledge dissemination or sharing in an organization will enhance the utilization (application) of knowledge. Darroch (2003) emphasized that the application of knowledge goes along the line of being responsive to knowledge collected and shared. For example, as organizations gather knowledge from customers and respond to it by producing products according to their customers' preferences, such knowledge application will help improve the overall company processes. Schwartz and Te'eni (2000)

also stressed that knowledge application contributes to the way the organizations manage their KM. Besides, as stated by Alavi and Leidner (2001), knowledge application is a crucial process that enhances organizational performance, in which knowledge is effectively transformed into action. Furthermore, the time taken to respond to such knowledge is essential, as knowledge that is applied quickly improves a firm's competitiveness (Darroch, 2003). Therefore, due to the ambiguity and uniqueness of knowledge dissemination and application to a firm, and the fact that knowledge has become integrated into the company processes, this will impact upon a firm's creation of sustainable competitive advantages (Day 1994; Grant, 1996; Fahey & Prusak, 1998; Teece, 1998, 2000).

In the words of Darroch (2005), a firm that can manage these three knowledge management components well is more innovative. As knowledge is an intangible asset that is close to impossible for competitors to access and copy, it provides company with a greater potential to develop its own competitive advantage (Kogut and Zander, 1992; Nonaka and Takeuchi, 1995; Foss, 1996).

Technological Innovation

Innovations promote changes. According to Lagrosen (2005), it is the key that unlocks growth possibilities, creating new markets, ensuring organizational long-term success and crafting out a competitive edge that is unbeatable (Corso, Martini, Paolucci, & Pellegrini, 2001; Du Plessis, 2007). Nonaka (1994) describes innovation as a process of generating new knowledge to solve problems. Innovation is defined by Lundvall and Nielson (2007) as an addition of new knowledge. Chen and Tsou (2007) defined innovation as the initiation, adoption, and implementation of new ideas or activities, and it 'entails identifying and using opportunities to create new products, services, or work practices' (Chen & Tsou, 2007).

Three categories of innovations that have received most consideration (Damanpour, 1991) are administrative and technical, product and process as well as radical and incremental (Damanpour, 1991; Wan, Ong, & Lee, 2005). Technical innovations refer to improvement towards the products, services or processes; administrative innovations refer to improvement in the organizational structure and administrative processes within the organization which are directly related to management (Damanpour & Evan, 1984; Lund & Gjerding, 1996).

Product innovations portray new products to the consumer in the marketplace; while process innovations depict new aspects of the production or service operations, for instance, materials or equipments used in the operation (Laursen & Foss, 2003; Laursen & Salter, 2006). In this research study, these two common forms of innovations, also known as technological

innovation (TI) have been adopted (Chuang, 2005; Cooper, 1998; Damanpour & Gopalakrishnan, 2001) as the dependent variable for the research model. The rationales for adopting TI are threefold. Firstly, according to Cooper (1998), these two forms of innovations have the capability to solve problems, improve performance, add value and develop the competitive advantage of a firm; hence it is recognized as the most significant form of innovation. Secondly, in the creation of new high-end products, many manufacturing firms have been relying heavily on technological innovation to achieve great results (Bi, Sun, Zheng, & Li, 2006). Thirdly, these two types of innovations have been related to the changes in the current products and processes in accordance with the technologies that are available (Roberts, 2007; Bi et al., 2006). Therefore, this research will measure technological innovation by looking at both the product and process innovations of firms.

Hypothesis Development

Relationship between Knowledge Management and Technological Innovation

Knowledge or tacit knowledge is an intangible asset – hence is difficult for the competitors to duplicate – serving as a competitive advantage for the innovating organizations (Darroch & McNaughton, 2003). Effective use of knowledge management will produce several advantages, such as enhancing the firms' ability to produce more knowledgeable products or services to the marketplace and introducing new products or services as well as increasing the firms' ability to produce. Therefore, knowledge management plays a pivotal role in promoting innovative performance (Johannessen, Olsen, & Olaisen, 1999; Wiig, 1999; Scarbrough, 2003; Lin & Lee, 2005).

According to Darroch and McNaughton (2003), the relationship between KM and innovative performance is not well proven. As a result, Darroch (2005) initiated an empirical study in New Zealand, gathering 443 samples from medium-to-large organizations. The result turned out to be favourable with the previous conceptual writings, in that a positive association between KM and innovation is found. The additional finding, however, failed to justify a link between innovation and firm's financial performance.

Another study has been done by Huang and Li (2009) in the attempt to understand the mediating relationships among social interaction, knowledge management, and innovation performance by conducting a survey among 176 Taiwanese firms. The finding revealed a positive relationship between KM with administrative and technical innovation. KM is also preceded by social interaction, and the authors believe that these two constructs have an impact towards innovation.

A firm practising KM is said to be a learning organization, in which this

learning capacity is proven to be more innovative than in average firms (Lundvall & Nielsen, 2007). Based on the large collection of Danish samples size ($n = 2007$), it is found that product innovation increases in probability as the firms organize themselves to become a higher level learning organization.

In fact, KM and innovation are well explored but, as pointed out by Darroch and McNaughton (2003), are 'not well proven' due to loosely defined KM; and also, different types of innovation were captured, e.g. product and service innovation. Therefore, interpretation of the effective knowledge management towards innovation performance should be taken with caution. For example, the innovation study by Darroch (2005) includes both radical and incremental innovation; meanwhile Tseng (2009) utilized a number of patents registered as the way to measure the firm's innovation. Another problem is that most empirical studies do not reveal the types of firms investigated.

Though such distinction somehow creates inconsistency in comparing previous studies, it should nevertheless not deter one from making a possible link between KM and innovation. Instead, using different KM and innovation measures will provide greater generalizability. For the purpose of this study, KM is represented by knowledge acquisition, dissemination, and application. Extant literature in the light of KM elements towards innovation is further explored in the next section.

Relationship between Knowledge Acquisition and Technological Innovation

Knowledge acquisition is the process of obtaining knowledge externally and making it appropriately for succeeding use (Holsapple, 2003). Hence, the knowledge generated externally will serve as the firm's competitive advantage. The acquired knowledge will combine with the existing knowledge to create new knowledge, for instance, new processes (Aranda & Molina-Fernandez, 2002).

It was proven in many research studies that knowledge acquisition has a positive relationship with innovations (Li & Calantone, 1998; Darroch & McNaughton, 2002). Tsai (2001) and Caloghirou, Kastelli, and Tsakanikas (2004) revealed that absorptive capacity has a positive relationship with the creation of new products, in which it incorporates knowledge acquisition. Absorptive capacity indicates the ability of the organization to acquire, incorporate information and make use of the information (Cohen & Levinthal, 1990). Organizations which are involved in absorptive capacity will possibly be able to enhance knowledge acquisition (Jantunen, 2005).

Caloghirou et al. (2004) also examined the relationship between internal capabilities and sources of external knowledge towards innovative performance of the organizations. The result has shown that internal capabilities,

absorptive capacity and sources of external knowledge are essential to increase innovative performance.

However, knowledge acquisition alone may be secondary in promoting innovation activities. Studies have proven that knowledge acquisition has an indirect role in generating innovation performance (Darroch & McNaughton, 2002; Jantunen, 2005). Jantunen (2005) has concluded in his research that knowledge acquisition and innovative performance do not have a significant relationship. However, it is believed that firms that practice knowledge acquisition are predicted to have a positive relationship with innovative performance. Thus, the formulated proposition is as follows:

P1 *Knowledge acquisition will positively affect technological innovation.*

Relationship between Knowledge Dissemination and Technological Innovation

Knowledge dissemination, also known as the sharing and transferring of knowledge, represents the exchange of information, expertise or knowledge between members within the firm (Bartol & Srivastava, 2002, Lin, 2007). In other words, knowledge sharing represents the convenience of accessing knowledge among the employees. Knowledge sharing contains two portions: knowledge donating and knowledge collecting. Knowledge donating indicates offering knowledge; whilst knowledge collecting refers to the process of collecting knowledge among the employees (Van den Hooff & Van Weenen, 2004; Lin, 2007). Literatures have identified knowledge sharing as an important factor to enhance innovation performance (Calantone, Cavusgil, & Zhao, 2002; Scarbrough, 2003) since the knowledge sharing process increases the accessibility of knowledge within the firm.

Good communication and interaction between organizational members can enhance knowledge sharing (Alavi & Leidner, 2001). Hence, the success of knowledge sharing depends on the individual's willingness to share knowledge (Chen & Huang, 2009), which is used to generate mutual learning and value creation. Consequently, effective conversion of organizational members' knowledge and expertise into explicit products or services (Nonaka & Konno, 1998; Yang, 2008) stimulates innovations (Chen & Huang, 2009). Firms with effective knowledge gathering and integration will be more distinctive in nature and pose a greater difficulty for competitors to duplicate, thus upholding the higher firm innovation performance potential (Lin, 2007).

Previous studies of knowledge dissemination and innovations demonstrate a mixture of results. For example, Hong, Doll, Nahm, and Li (2004) concluded in their study of the automotive industry that knowledge sharing enhances process performance. Furthermore, studies also found that

knowledge sharing is positively related to the firms' capability to innovate (Calantone et al., 2002; Lin, 2007). However, Inkpen and Dikur (1998) pointed out that the distance between organizational members may inhibit the process of learning and sharing knowledge. Thus, network expansion is necessary for individuals to expose themselves to new ideas. Employing IT does increase knowledge transfer and sharing among organizational members, in particular those beyond the formal interaction process (Alavi & Leidner, 2001).

A study was conducted in the United States involving US manufacturers and services that examines the link between the transferring of tacit knowledge to the innovation capability. The researchers highlighted that tacit knowledge transfer is positively related to innovation capability of the firms. Increase in this capability will increase the innovative performance of the firms (Cavusgil, Calantone, & Zhao, 2003). In another study focusing on the flat panel display industries, Spencer (2003) revealed that firms that practices knowledge sharing have higher innovative performance. These firms will be able to generate more value to the firm when they share R&D knowledge together with the innovation system. Lin (2007) concluded that both components of knowledge sharing, which were knowledge collecting and donating were positively related to the firm's innovative capability which contributed towards innovative performance.

In another survey conducted in New Zealand, involving 443 firms that contain more than 50 employees, the relationship between knowledge management and types of innovation are examined, which are radical and incremental innovations. Three components of knowledge management, namely knowledge acquisition, knowledge dissemination and responsiveness to knowledge are examined together with innovation. However, knowledge dissemination was found to provide indirect support towards innovation (Darroch & McNaughton, 2002). This is further proven by Jantunen's (2005) study that surveyed 217 Finnish firms, which concluded that knowledge dissemination does not have a significant relationship with innovation performance. It was further argued that organizations which implement all the elements in the knowledge management processes will be able to utilize that knowledge for innovation activities. Besides, Moorman and Miner (1997) revealed that high memory dispersion, which represents sharing of organizational knowledge among members, distracts creativity or inhibits new ideas during a high degree of changes in technological environment. Thus, knowledge dissemination is expected as one of the knowledge management processes that can enhance innovative performance. The following proposition is formulated:

P2 *Knowledge dissemination will positively affect technological innovation.*

Relationship between Knowledge Application and Technological Innovation

Knowledge application is described as developing the knowledge acquired, enabling knowledge to be more effective so to increase its worth. According to Cegarra-Navarro and Martínez-Conesa (2007), it incorporates the information acquired from both the acquisition and distribution stages, which are then integrated into the daily business processes, which will then lead to an increase in the economic effectiveness and efficiency of a firm's operations. In other words, the knowledge that resides in the organization will be exploited to generate products, services or processes. Hence, knowledge application will be useful and significant to generate value for the organization (Bhatt, 2001).

The application of the knowledge provides a more powerful distinctive competency for the firms (Alavi & Leidner, 2001). Firms that engage in knowledge application can realize superior performance. Application of the specialized knowledge can enhance organizational competency by reducing the possibility of imitation (Grant, 1996). In other words, knowledge application produces superior value for the firms, such as firms' innovation or profitability (Johannessen et al., 1999; Lin & Lee, 2005).

Darroch (2005) did a business case study in New Zealand for the role of knowledge management within firms. The purpose of the study is to empirically investigate the linkage between knowledge management, innovation and the performance of firms. 443 survey data were collected from the CEOs coming from firms with more than 50 employees. Using structural equation modelling analysis, the results confirmed that knowledge management – one aspect of which is responsiveness to knowledge – positively predicted innovation, which is defined as resources, routines and capabilities that underpin outputs. This study has thus provided empirical evidence in that firms with efficient knowledge management ability will utilize their resources more effectively, and as a result become more innovative and perform better.

Apart from that, Lin and Lee (2005) revealed that out of three knowledge management processes, only knowledge acquisition and knowledge application are positively related to innovative performance; that is, technological innovation. The researchers indicated that knowledge acquisition and knowledge application have a positive relationship with the adoption level of e-business. Jantunen (2005) also obtained a similar result in that the researcher proved that knowledge application plays an important role in supporting innovative performance. Hence, it can be concluded that the firms that practices knowledge application are better at promoting innovation performance. The following proposition is formulated:

P3 *Knowledge application will positively affect technological innovation.*

Conceptual Framework

Given the thorough discussion in the literature review section, we develop a theoretical framework that examines KM's influence on technological innovation. Figure 1 describes the relationship between KM practices and technological innovation. KM, which is the independent variable, is represented by three dimensions (i. e. knowledge acquisition, dissemination and application); while technological innovation, measured from the perspectives of process and product innovations, is the dependent variable. According to this model, it is suggested that the greater the presence of KM practices in organizations, the higher the level of technological innovation is in the firms.

Implications

Theoretical implication

Given the significance of innovation performance in the research field, there is an increasing research focusing on the most effective processes that can enhance the innovative capability of a firm. Although past studies have proven that there is a relation between KM processes towards innovation performance, there is inadequate research to prove that a relationship does exist from the perspective of a developing nation. Hence, a revised model based on the three KM processes has been suggested in this study to examine if such processes do contribute to the technological innovation of an organization. The significance of the three knowledge management dimensions, which are knowledge acquisition, dissemination as well as application, have been highlighted and emphasized regarding how such practices can influence the technological innovation, in particular the product and process innovation of a company. It can be concluded that the proposed model serves as an essential framework for both researchers and practices to comprehend the impact the knowledge management practices can have on a firm's technological innovation.

Practical Implications

From the managerial perspective, this paper provides useful insights to managers, in particularly for those firms that have initiated the knowledge management practices. The significance of the three processes of knowledge management has been highlighted regarding how they can influence a firm's product and process innovation. First and foremost, knowledge acquired internally or externally, combined with existing knowledge, can help a firm create new processes and new products. Secondly, knowledge dissemination, which represents the exchanging and sharing of knowledge, does increase the accessibility of knowledge within a firm and has been recognized in the literature as an important factor to improve a firm's innovative

capability. Thirdly, the application of knowledge also aims to improve the technological innovation of a firm, as the utilization of knowledge enables a firm to generate new products, processes and services that are of significant value to a company. The industry can benefit much from this study, as the practitioners will know precisely which KM practices to focus on and to apply at the organizational level to enhance the rate of technological innovation. By incorporating an effective set of KM processes, the organizations can indeed achieve a more desirable outcome in terms of technological innovation.

Conclusion

As a summary, the proposed research framework of this study demonstrates the relationship between the contribution of the knowledge management process and its effect towards an effective technological innovation. Despite this, it is important to note that the extant literature generally depicts two groups of thinking (as cited in Andreeva & Kianto, 2011), i. e. knowledge processes directly impacting on innovation, or the nature of innovation as part of knowledge-based processes.

The conceptual model can be useful only if the external moderating factors were identified and addressed, however such effort may be confusing when the moderating factors exist even within the proposed constructs. For instance, Andreeva and Kianto (2011) highlighted knowledge creation as one of the four main knowledge processes in predicting innovation, in which its innovation is measured as innovation in products/services, processes, management and marketing. Additionally, knowledge creation appears to mediate the relationship between other knowledge processes (knowledge sharing, knowledge acquisition, documentation) and innovation.

In addition to that, other constructs related to knowledge, such as the knowledge value chain model developed by Holsapple and Singh (2001) may be considered for future model development as it recognizes five major classes of knowledge manipulation activities that take place in a variety of patterns within KM episodes. The knowledge chain model is divided into five primary (i. e. knowledge acquisition, selection, generation, assimilation, and emission) and four secondary activity classes (i. e. knowledge measurement, control, coordination, and leadership), in which they can lead to changes in a firm's state of knowledge (Holsapple & Jones, 2004). Furthermore, knowledge selection, as proposed by Hosapple and Jones (2004) can also be incorporated as a separate predictor variable when developing a future conceptual model so as to improve on the present model. Knowledge selection is plainly defined as choosing the required knowledge from internal sources and making it suitable for future use (Hosapple & Jones, 2004). When firms have acquired knowledge internally and externally, cou-

pled with the current knowledge, this can assist the firm in the creation of new products and processes.

From past literature, the effectual use of knowledge management practices is the key that unlocks the innovativeness in a firm. The suggested model is deemed valuable to both practitioners as well as managers as it will prepare them towards improving the firms' technological innovation capability. It is proposed that this framework is to be tested with empirical data to find out which KM practices contribute the most to the technological innovation activities of a firm. Possible instruments that can be used to operationalize the constructs may be obtained from Martinez-Costa and Jimenez-Jimenez (2009) and Perez Lopez, Peon, and Ordas (2006) for knowledge management, and Prajogo and Sohal (2003) for technological innovation. Such findings are expected to provide us with more insights and deepen our understanding on the relationship between KM processes and technological innovation. Essentially, such findings can further be used to gauge the effectiveness of KM in enhancing a firm's technological innovation level, which are vital elements of an unbeatable firm in the new era.

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