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Article *in* Journal of Modelling in Management · February 2016

DOI: 10.1108/JM2-07-2014-0061

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Integrating knowledge management (KM) strategies and processes to enhance organizational creativity and performance: An empirical investigation

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Received 4 June 2013
Revised 24 July 2014
Accepted 17 September 2014

Integrating knowledge management (KM) strategies and processes to enhance organizational creativity and performance

An empirical investigation

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Abstract

Purpose – This study aims to identify if an integration between knowledge strategy and knowledge management (KM) processes leads to organizational creativity and performance.

Design/methodology/approach – Quantitative strategy and cross-sectional survey method were used to collect data. In all, 219 randomly selected respondents from 173 listed companies provided feedback through self-administered questionnaire. Factor analysis and multiple regression techniques were used to test multiple hypotheses.

Findings – Results revealed the significant positive impact of system-oriented KM systems strategy on KM process capabilities, creativity and organizational performance. No significant impact has been found of human-oriented KM strategy on different KM processes and organizational performance. However, it interestingly has a significant negative relationship with organizational creativity. KM processes have significant impact on organizational creativity and performance. Organizational creativity has also been identified as having a strong significant impact on organizational performance.

Originality/value – This paper fills the knowledge gap by undertaking a study which has not been conducted before.

Keywords Knowledge management, Creativity, KM strategies, KM process capabilities, Organization performance

Paper type Research paper

Journal of Modelling in Management
Vol. 11 No. 1, 2016
pp. 154-179

1746-5664
DOI 10.1108/JM2-07-2014-0061

Introduction

On the verge of the twenty-first century, the recognition of the value of knowledge as the most strategic and important resource for the sustained competitive advantage and superior organizational performance is on constant rise (Prieto and Revilla, 2004; Schwaer *et al.*, 2012). Knowledge's appearance as a strategic resource is overturning the rules of competition and strategy-making process, and as a result, organizations are striving to develop and strengthen their knowledge management (KM) systems and capabilities (Lee and Choi, 2003; Von Krogh *et al.*, 2012). In this vein, contemporary management thinkers and practitioners are facing challenges to answer various questions such as: "how and in what ways knowledge can be effectively managed and what benefits it could bring to the organization". While responding to these questions, a number of researchers have identified knowledge strategy (Wenger, 2004; Zack, 1999), KM processes (Claver-Cortes *et al.*, 2007), KM enablers (Ho, 2009; Yeh *et al.*, 2006) and different KM practices (Darroch, 2003; Darroch and McNaughton, 2002) as critical factors to be taken into account to translate strength of knowledge resources into superior organizational performance (Zack *et al.*, 2009).

Although the contribution of KM in bringing competitiveness and superior performance is well acknowledged, the process through which KM practices yield organizational performance is still vague and needs further investigation (Holsapple and Singh, 2001; Shahzad *et al.*, 2013). Given the fact that organizations have initiated various KM programs duly supported by sophisticated information and communication technologies, the desired outcomes were seldom achieved (Yu *et al.*, 2004). In some cases, KM system ended up in total failures and resultant huge costs (Storey and Barnett, 2000). Zack (1999) posits that although organizational initiatives are necessary for KM processes, they do not determine that what kind of knowledge needs to be developed and how much efforts and resources it would take. To achieve intended organizational performance, KM has to be linked with the strategic context of the organization which, according to Zack (1999), is business strategy. He suggests that for organizations to succeed in knowledge-based competition, it is necessary to develop a knowledge strategy that would best use organizational knowledge-based capabilities to address its strategic needs. He concludes that KM needs a clear direction for organization's different knowledge-based activities and processes that can only be provided by the organization's knowledge strategy and which can only be derived from the organization's strategy. Lee and Choi (2003) assert that despite the excessive discussion available on knowledge strategy and different KM processes, very little empirical work has been undertaken to establish its relationship. It is therefore logical to investigate that what impact different KM strategies have on different KM processes.

However, the issue of effective KM does not end with the linkage of KM strategy with different KM processes. Another problematic area is related to the quantifiable outcomes of KM where clarity about the impact of different KM processes on the organizational performance is missing. Some researchers assert that KM processes do not directly influence organizational performance; instead, performance improves through some intermediate outcomes that knowledge processes and practices yield (Hsu, 2008; Law and Ngai, 2008). López-Nicolás and Meroño-Cerdán (2011) assert that despite the significant development in KM field, practitioners still do not much know as to what variables they need to consider to enhance KM effectiveness in terms of its guaranteed impact on organization performance.

This study argues that although capabilities of an organization for effectively managing knowledge can be enhanced by KM strategies but organizational performance would go up only if different knowledge processes improve creativity and innovative capabilities of respective organization. Organizational creativity and innovation is the area that has received a very little attention of researchers in KM field (Choi *et al.*, 2008; Darroch, 2003). This study thus intends to fill the identified gap by identifying as how KM strategy and different KM processes can integrate with organizational creativity process to affect organizational performance. This research, therefore, probes the nexus among various variables that serve as antecedents to knowledge processing capabilities as well as shape consequences of such knowledge processes outcomes. More specifically, the research explores nexus among KM strategy, KM process capabilities and creativity and performance of the organization.

The following research questions are to be investigated in this regard:

RQ1. What impact do KM strategies have on KM process capabilities, organizational creativity and firm's performance?

RQ2. What kind of relationship exists between organizational KM process capabilities, creativity and performance?

RQ3. What is the impact of organizational creativity on firm's performance?

Significance of the research

This study focuses on the role of KM in firm's competitive performance by assuming that KM strategy enables KM process capabilities that lead to organizational creativity and which eventually leads to superior organizational performance. This study will fill the gap regarding organizational practices and KM discipline, and will provide understanding to the academicians and practitioners about KM components and their outcomes. Second, this study will provide empirical evidences to practitioners regarding the effectiveness of KM strategies' contribution to KM process capabilities and how these in turn contribute to organizational creativity and performance.

Literature review

Knowledge

Knowledge has been defined and discussed from multiple perspectives and in a number of ways (Hlupic *et al.*, 2002). Depending upon the context, the word "knowledge" has been interpreted in terms of data, information, expertise, experiences, skills, intelligence, intuition, insights and ideas. The debate is still on, and there exists a significant difference among researchers, practitioners and philosophers on the epistemological and ontological assumptions about the knowledge (Nonaka and Peltokorpi, 2006). Following the traditional epistemology of knowledge, Nonaka (1994) defines knowledge as the "justified true belief", a concept that was first introduced by Plato. Davenport and Prusak (1998) define knowledge "as a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information". Sveiby (2001) defines knowledge as the ability of an individual to evaluate information around him and then act in an efficient manner. Myers (1996) defines it as a natural human quality that is vested in living minds as they intend to identify, interpret and internalize information. Wiig (1993) views knowledge as a combination of know-how, methodologies, expectations,

judgments, concepts, perspectives, beliefs and truths that humans hold during their course of life.

Regarding the ontological assumptions of knowledge, it has also been divided into multiple categories, and thus, various typologies regarding the nature and kind of knowledge have been presented. Understanding of different types of knowledge is necessary because these distinctions influence the theoretical developments in the area of KM (Alavi and Leidner, 2001). There are different types of knowledge such as:

- explicit knowledge and tacit knowledge (Tiwana, 2002);
- diffused and undiffused knowledge, codified and un-codified knowledge (Boisot, 1987);
- structured, social and human knowledge (David and Fahey, 2000);
- self-motivated creativity (care-why), systems understanding (know-why), advanced skill (know-how) and cognitive knowledge (know-what) (Quinn *et al.*, 1998);
- experiential knowledge (what-was), social knowledge (know-who), process (know-how), explanatory knowledge (know-why) and specified catalogue knowledge (know-what) (Miller, 1996); and
- encoded (formal or symbolic), embedded (systematized), en-cultured (social), embodied (perceptual) and embrained knowledge (cognitive) (Blackler, 1995).

At this point, it may be noteworthy that there are many different types of knowledge that have contributed to the theoretical developments of KM field. Some of these are being mentioned here only to highlight the fact that there has been a significant theoretical development in this field. However, the present paper will focus on the commonly used tacit and explicit typology of knowledge as presented by Polanyi (1966) to discuss KM and its processes in the next sections.

Knowledge management

Prevalence of knowledge in organization is not enough unless there are proper systems and processes that can effectively manage that knowledge. KM is the process which is used within the organization to create, share, codify, disseminate and institutionalize tacit and explicit knowledge (Darroch, 2003; Nonaka and Von Krogh, 2009). KM is an art that deals with the transformation of intellectual assets and information to create value for multiple stakeholders by deploying appropriate strategies and processes for the identification, acquisition, creation and sharing of knowledge in the organization (McCampbell *et al.*, 1999). Davenport and Prusak (1998) report that KM deals with the management of organization's and employee's both explicit and tacit knowledge through acquiring, organizing, sustaining, applying, sharing and renewing knowledge by deploying specific and systematic processes to create value and improve performance of the organization. Effective KM allows organizations to be faster, more efficient, innovative and effective than the competition. However, just like knowledge, as KM has received its epistemological and theoretical grounds from multiple disciplines, that is philosophy, computer science, economics, etc., there also exist differing perspectives regarding the management of knowledge in the organization. Gao *et al.* (2008) have defined these perspectives into two generalized categories, namely, "hard track/group and soft track/group". Hard group assumes that "knowledge comes from information, information comes from data, and data comes from

events". KM, according to this group, deals with the management of explicit knowledge, which can be fostered through IT infrastructure (i.e. databases, MIS, knowledge repositories, IT servers, etc.) and supporting software (i.e. expert systems, decision-support systems, data mining systems, etc.) (Boisot, 1995; Boisot and Canals, 2004; Davenport and Prusak, 1997).

On the other hand, soft group also focuses on the tacit side of knowledge and endorses the importance of people, enabling space, community of practice and culture in different KM processes, that is, knowledge creation, sharing, etc. (Nonaka and Peltokorpi, 2006). This group assumes that knowledge is different from information which resides in human mind and is embedded in actions. Knowledge can be created and shared only through human interaction; and the role of IT in this process is only to facilitate human interaction (Sveiby, 2001; Zack *et al.*, 2009).

Regardless of the hard-soft distinction, KM has become a crucial factor for organizational success and sustainability. Demarest (1997) points out that those firms who have not incorporated proper KM systems will remain unable to create and sustain competitive advantage, and will eventually lose their market positions as compared to the firms who actively practice KM. Given the necessity and benefits of KM, serious costs are associated with KM and, therefore, due consideration needs to be given before implementing a KM strategy. Davenport and Prusak (1997) argued that KM is expensive and, thus, can only get support if it can be linked to the extrinsic economic benefits that are generated only if such initiates are able to provide a clear competitive advantage to the firm.

KM strategies

As knowledge is an important resource for organizations, it has to be managed very strategically and with a clear direction that can only be attained through a vivid KM strategy. In doing so, this resource is also aligned with the overall business strategies of the firm for superior performance. Organization can adopt various KM strategies to foster the development and utilization process of its knowledge assets through the capabilities of knowledge processes that include knowledge creation, knowledge sharing, knowledge application and knowledge integration (Zack, 1999). Knowledge strategies can be defined as the set of strategic choices that direct and shape the organization's learning process and subsequently determine the firm's knowledge resources (Zack, 1999). An organization's KM strategy is not an arbitrary decision; instead, it merely depends on the "way the company serves its clients, the economics of its business, and the people it hires" (Hansen, 1999). Greiner *et al.* (2007) have categorized these KM strategies into codification and personalization strategy, both differing in their respective KM objectives and focus on knowledge types. However, Choi and Lee (2003) have labeled these strategies as human strategy and system strategy. Because codification and system, and personalization and human are the two sides of the same coin; this study tend to use categorization of human and system strategy as introduced by Choi and Lee (2003). Human-orientated strategy deals with person-to-person contacts and dialogue via social networks, acquiring knowledge through skilled and experienced person and sharing knowledge informally. On the contrary, system strategy of KM deals with knowledge codification, storing and codification knowledge via IT and sharing knowledge formally.

KM strategies influence both organizations as well as individuals working in an organization (Bhatt, 2002). KM strategies are reflective of characteristics of a firm like goals, organizational character, technology and behavior (Earl, 2001). The literature

identifies several taxonomies of KM strategies, (Schulz and Jobe, 2001) all having strong correlations with KM process capabilities. All firms do not use similar KM strategies, and thus, the difference in selection and implementation of any specific KM strategy largely depends on multiple environmental and organizational factors. Wu and Lee (2007) suggest that the companies evaluate and select favorable KM strategies that serve their competitive advantage. KM strategy selection is a multiple criteria decision-making process (Wu, 2008), hence requiring consideration of large number of factors.

KM process capabilities

KM process is a purposeful, persistent and ongoing network of people's interactions for managing other activities, components and people that participate in basic knowledge processes, and it creates a unified, directed and planned circle that transmits, acquires, enhances, maintains and produces enterprise's knowledge base (Firestone, 2001). According to research evidences, social networks (Chow and Chan, 2008) and engagements of social actors are essential to maintain effective knowledge processes in organizations (Huang and Newell, 2003). Additionally, knowledge networks in organizations are strongly related to various KM outcomes, such as organizational learning, innovation, speed-to-market and new product success (Akgün *et al.*, 2005). These studies also indicate that knowledge processing capabilities are largely influenced by organizational context. Nonaka and Takeuchi (1995) identified a framework of knowledge processing capabilities, that is, socialization, externalization, combination and internalization. Viewed from this perspective, KM strategies are related to KM processing capabilities.

In this study, the knowledge creation model as proposed by Nonaka and Takeuchi (1995) and named as SECI model is adopted. It is a continuous process through which various groups and individuals create, share, disseminate and institutionalize knowledge. The SECI model consisted of four modes named as socialization, externalization, combination and internalization. There are some reasons for which this model is adopted, that is, wide acceptance of this model, and used in different research areas like information technology (IT), new product development, joint ventures and organizational learning (Kidd, 1998; Scharmer, 2000; Scott, 1998).

Knowledge management and organizational creativity

KM intermediate outcomes reflect non-financial and financial aspects of organizational performance. Davenport (1999) suggested that KM process capabilities should be linked with KM intermediate outcomes to better understand the KM performance. In this study, organizational creativity is taken as proxy of KM intermediate outcomes because it is considered as the heart of KM initiatives (Gurteen, 1998), and serves as a seed of all innovations (Amabile *et al.*, 1996). In today's ever-increasing environmental complexity and turbulence, organizational creativity has been viewed as a key to survival and growth (Woodman *et al.*, 1993). Amabile *et al.* (1996) recognized creativity as a capability that creates useful and valuable processes, procedures, ideas, services and products by the individuals that further help them create value for the multiple stakeholders.

Knowledge management and organizational performance

Firm's performance in simple terms can be defined as the aggregate output of its total activities that it undertakes. Firm's performance is an accumulation of

multi-dimensional constructs, and it is seen as being affected by different organizational strategies and activities which may have different effects on the dimensions of organizational performance (Lumpkin and Dess, 1996; Ray *et al.*, 2004). Superior performance depends on the quality of the "fit" among the organization's strategic orientation and its resources (Miles and Snow, 1994; Miles *et al.*, 1978). Because knowledge has been acknowledged as a strategic resource of a firm, KM strategy should be viewed as a mediating factor between business's strategy and performance. KM is an integral part of continuous performance improvement, as knowledge can provide a firm with the capabilities to identify, examine and capture market opportunities and ultimately provide the firm with superior performance (Massingham, 2004). Sveiby (2001) states that KM strategies working in line with business strategies cannot generate the right results unless the right knowledge creation and transfer activities are placed within the organization. Therefore, the performance of the firm will not only be dependent on the right fit of business-knowledge strategies, but will also require the right knowledge creation and transfer activities by the firm.

In KM field, organizational performance measurement methods can be classified into four groups:

(1) balanced scorecard (Kaplan and Norton, 1996);

(2) intangible and tangible benefits (Simonin, 1997);

(3) intellectual capital (Sveiby, 1997); and

(4) financial measures (Bierly and Chakrabarti, 1996).

Selection of an instrument that would cover all aspects of organizational performance is very tough, as there is no universally accepted measure to gauge organizational performance. For this study, a measure developed and validated by Deshpandé *et al.* (1993) and Drew (1997) is adopted. This instrument measures an organization's performance in multiple dimensions.

Empirical work on the relationship between KM strategies, KM process capabilities, creativity and organizational performance

Gold *et al.* (2001) developed a model combining the contingency and organizational capability perspective theory to examine relationship between knowledge infrastructure capability – social capital, culture, structure and technology – and knowledge process capability – acquiring, converting, application and protecting. Choi and Lee (2002) proposed a model to examine the impact of knowledge creation process – SECI model (Nonaka, 1994) – on the performance of the organization, such as successfulness, innovativeness, growth rate, profitability and market share by incorporating both system- and human-oriented KM strategies. Study found that both system- and human-oriented KM strategies were significantly related to organizational performance and knowledge creation process. In addition, system-oriented strategy was suitable for combination, and human-orientation strategy was suitable for socialization. Zack (1999) and Hansen (1999) reported that KM strategies are instrumental in achieving knowledge capabilities and knowledge resources; thus, an alignment between KM strategies and KM process capabilities is lynchpin to attain improved organizational performance. That is why, distinctive and valuable capabilities of KM

process should be identified and guided by appropriate KM strategies (Holsapple and Singh, 2001; Zack, 1999).

The interface between KM strategies and KM process capabilities is significantly important. For example, the KM processing capabilities as proposed by Nonaka and Takeuchi (1995) are intertwined with KM strategies like human orientation and system orientation. Because both human- and system-oriented KM strategies provide basis for socialization, externalization, combination and internalization, the nexus between KM strategies and KM process capabilities hold strong connection. Laupase (2002) proposed a model to describe the knowledge conversion processes of Australian national and international management consulting firms, and also examined the relationship between IT, structure and culture, and knowledge conversion processes. Study found that: "(a) being together in a formal meeting did not guarantee that tacit knowledge would be shared among the attendees; (b) none of the firms created written documentation for their knowledge development that could be accessible by other members of the firms; (c) despite the hybrid structure proposed to support the conversion process, a loose structure and a network organizational structure emerged during the study and supported the knowledge conversion processes in management consulting firms; and (d) reward systems, as part of a supportive organizational culture encouraged the conversion process, (e) however, information technology facilitated this whole process only partially, because this technology was regarded as a tool to accelerate the activities of the consulting practices".

Keskin (2005) proposed a theoretical model, and empirically examined the relationship between KM strategies – tacit-oriented strategy and explicit-oriented strategy – and firm performance – innovation, profitability, growth, market share and success. The study hypothesized that both tacit- and explicit-oriented strategies have positive impact on organizational performance in light of the intensity of market competition and environmental hostility. Study revealed that both tacit- and explicit-oriented strategies have positive impact on performance, but explicit-oriented strategy has more impact than tacit-oriented strategy. Study also indicated that higher the intensity of market competition and environmental hostility, higher would be the effect of strategies on firm performance.

Lee and Choi (2003) proposed a model to investigate relationship between KM enablers – structure, technology and culture – and KM process capability – acquiring, converting, application and protecting – and KM performance – KM satisfaction and effectiveness. Study found that: "(a) technology was a significant positive explanatory variable of knowledge acquisition, knowledge conversion, and protection, (b) organizational culture was a significant positive explanatory variable of knowledge management performance, and knowledge application, (c) structure was a significant positive explanatory variable of knowledge management performance, knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection, and (d) knowledge acquisition, knowledge application, and knowledge protection were significant positive explanatory variables of knowledge management performance".

Hsieh (2007) proposed an integrated model to examine relationship between KM strategy, enablers, process capabilities, organizational performance and organizational characteristics. Study found that:

- both human- and system-oriented KM strategies have a positive significant effect on performance of the organization and KM enablers and KM process capability;

- organizational culture and informational technology have a positive significant effect on performance of organization and KM process capability;
- decentralization has a significant inverse effect on the performance of organization and KM process capability; and
- annual sales in dollars has a positive significant impact on KM process capability and KM strategies.

Theoretical framework

Primarily based on the works of Lee and Choi (2003); Hsieh (2007) and Nonaka and Takeuchi (1995), this study aims to develop a new integrated model to examine relationships between KM strategies, KM process capabilities, creativity and performance of the organization. This study includes KM strategies, KM process capabilities and organizational performance in the research model to examine the link between KM process capabilities and performance of the organization by incorporating creativity as a mediating variable between KM process capabilities and performance. This research borrows its theoretical foundations from the resource-based view (RBV), knowledge-based view (KBV) and systems thinking theory. KM strategies directed at organizational performance are explained by strategic management perspective of RBV. Knowledge processes and their relationship with creativity and performance are explained by KBV. And the rationale to develop a coherent, integrated and interdependent model of successful KM is endorsed by systems thinking perspective.

Organizations strive to improve their performance and value-creation processes by acquiring and utilizing superior resources in a creative and innovative manner. RBV explains the role of resources and dynamic capabilities in firm's value-creation process and achievement of sustainable competitive advantage that is a proxy of superior organizational performance and higher economic returns (Barney, 1991; Wernerfelt, 1984). RBV identifies the features that an organizational resources must have and the process through which those resource can be developed. Superior performance of any organization will depend on its ability to craft a strategy that would select and accumulate strategic resources and utilize those resources to create sustainable competitive advantage. Based on the principles of RBV, KBV has declared knowledge as the most strategic and valuable resource that helps organization to create and sustain competitive advantage, a fundamental proxy of superior performance (Kogut and Zander, 1996; Nonaka and Takeuchi, 1995). According to this perspective, stock of knowledge would serve as a source of competitive advantage, and KM should endeavor to develop strategy, processes, practices, tools and methods to acquire, share, disseminate, use and codify superior knowledge to increase the value for multiple stakeholders (Holsapple and Singh, 2001).

Because knowledge creation and sharing is an ongoing process, such arrangements would help individuals to learn and bring innovation in value-creation processes to increase economic returns for organizations. The role of KM strategy in this regard becomes crucial, as it integrates the dynamic capabilities and knowledge advantage of a firm to create a competitive advantage. However, the impact of KM strategies on organizational performance cannot be seen in isolation. Organizational performance mainly depends on its ability to create and use innovative knowledge to produce profitable products and services through knowledge strategy, continued learning and development. Systems thinking theory in this regard takes a holistic perspective, and

views individual parts in relation to their interrelatedness to other parts of the whole system. Contrary to the traditional perspectives, system thinking breaks a larger system into smaller parts, and then studies the interdependence, interrelatedness and effects of different parts on each other to identify the completion process of a whole. This perspective has widely been used in cross-disciplinary research, such as economics, human resources, medical, development, etc. Therefore, the integration of different variables in research model proposed by this study is explained by systems thinking perspective while investigating the relationships between KM strategy, KM processes, organizational creativity and eventually performance. Study's proposed research model can be seen in Figure 1.

Hypothesis of the study

In this study, four variables are incorporated in the model, which are KM strategies, KM process capabilities, KM intermediate outcome and organizational performance. KM strategies include: human- and system-oriented strategies. KM process capabilities include socialization, externalization, combination and internalization (SECI model) proposed by Nonaka and Takeuchi (1995). KM intermediate outcome include organizational creativity. Organizational performance includes successfulness, market share, growth, profitability and innovativeness. In light of the reviewed literature and theoretical framework, the following hypotheses are to be tested:

H1. Human-oriented KM strategy has a positive impact on all KM process capabilities as defined by SECI.

H2. System-oriented KM strategy has a positive impact on all KM process capabilities as defined by SECI.

H3a. Human-oriented KM strategy has a positive impact on organizational creativity.

H3b. System-oriented KM strategy has a positive impact on organizational creativity.

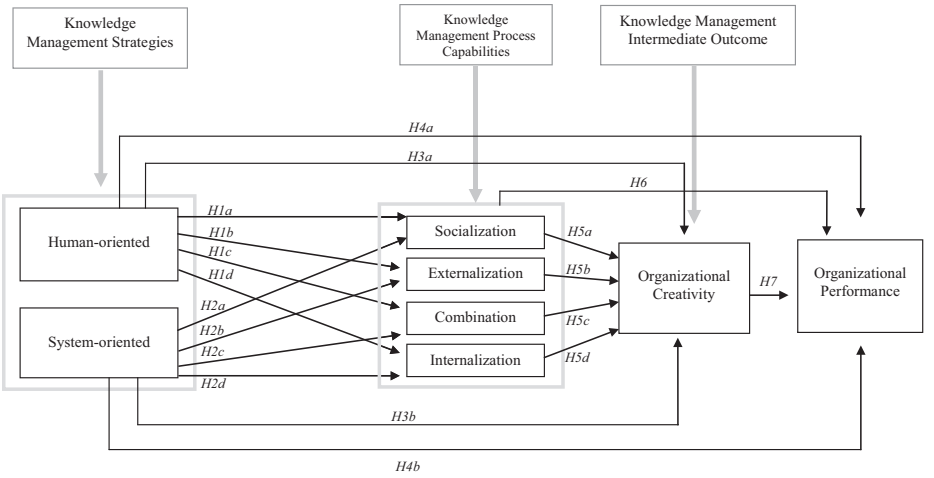

Figure 1.
Study's research model

H4a. Human-oriented KM strategy has a positive impact on organizational performance.

H4b. System-oriented KM strategy has a positive impact on organizational performance.

H5. Different KM process capabilities have a positive impact on organizational creativity.

H6. Different KM process capabilities have a positive impact on organizational performance.

H7. Organizational creativity has a positive impact on organizational performance.

Research methodology

This study used quantitative research strategy and cross-sectional survey method for the collection of data. A multi-item questionnaire consisting of five-point Likert scale, from strongly disagree to strongly agree, was adopted from the work of Lee and Choi (2003). Instrument was finalized in consultation of academic and industry experts. After making minor language changes, pilot testing was undertaken, and in light of satisfactory results of pilot testing, an instrument with 37 items was finalized. In this study, organization was taken as the unit of analysis. However, the unit of interest was manager working in business organizations. For this purpose, contact information of 581 companies listed at Lahore Stock Exchange (LSE) was obtained. Hair *et al.* (1995) suggest that three, five or seven responses should be collected against one field question to produce valid findings. By looking at the lack of research culture in Pakistan and skeptic approach of organization toward surveys, it was decided to obtain five responses against every question. There were 37 field questions in the instrument, so it was appropriate to obtain 200 usable responses. In anticipation of 3-5 responses from every company and response rate of 10 to 20 per cent, 250 companies were randomly selected from the list to send survey request. During a period of 2 months, 219 usable questionnaires were successfully received from 173 companies.

Respondents' profile

Brief profile of the respondents is given in Table I. Majority of the responses came from manufacturing industry (78 per cent). Majority of the responses (74 per cent) came from sales, production and accounting departments. In all, 39 per cent of the organizations had annual revenue ranging from Rs 100 to 500 million, whereas 21 per cent organizations had annual revenue ranging from Rs 500 million to less than 1 billion. In all, 54 per cent organizations had employees between 200 and 1,000.

Results and findings

Reliability analysis

Table II presents reliability scores where all constructs reported scores within the range of 0.70 to 0.90, thus satisfying the guidelines provided by Nunnally (1959).

Factor analysis

To identify the underlying factor structure of variables, exploratory factor analysis was performed. Factor analysis was deployed to reduce system- and human-oriented KM

Description	No.	(%)
Industry type		
Manufacturing	170	77.6
Financing	36	16.4
Services	9	4.1
Others	4	1.9
Total	219	100
Department		
Planning	10	4.6
Sales	51	23.3
Production	66	30.1
Accounting	45	20.5
Information system	11	5.0
R & D	7	3.2
Other	29	13.3
Total	219	100
Annual sales		
Less than Rs 100 million	9	4.1
Rs 100 million to below Rs 500 million	84	38.4
Rs 500 million to below Rs 1 billion	48	21.9
Rs 1 billion to below Rs 5 billion	8	3.7
Rs 5 billion to below Rs 10 billion	12	5.5
Rs 10 billion and above	18	8.2
Missing	40	18.3
Total	219	100
Number of employees		
Less than 200	16	7.3
200 to below 500	53	24.2
500 to below 1,000	70	32.0
1,000 to below 3,000	23	10.5
3,000 to below 10, 000	34	15.5
10,000 to below 30,000	11	5.0
30,000 and above	12	5.5
Total	219	100

Table I.
Respondents' profile

Variables	Cronbach's alpha	No. of items
KM strategy (human oriented)	0.769	4
KM strategy (systems oriented)	0.731	4
KM processes (socialization)	0.825	5
KM processes (externalization)	0.857	5
KM processes (combination)	0.809	5
KM processes (internalization)	0.740	3
Organization creativity	0.883	5
Organization performance	0.876	5
All items	0.910	36

Table II.
Reliability scores

strategies, KM processes, organizational creativity and performance to their constituent factors. Principal components analysis with Varimax rotation was applied to extract factors with eigenvalues greater than 1 and factor loading greater than 0.50 to obtain a robust and more interpretable factor structure. The Kaiser–Meyer–Olkin test and the Bartlett test of sphericity were used to validate the loading of different variables on their respective factors. Items with factor loadings lower than 0.50 were dropped from subsequent analysis.

Except one question, all the items used in this study's survey instrument were loaded on their principle constructs as proposed by Lee and Choi (2003). Kaiser's score was high and within the satisfactory range. Bartlett's test score was also within acceptable range and highly significant. Factor solution produced eight factors that explained 70 per cent of the variance. One item that could not load on any factor belonged to KM process of internalization, and was finally removed from the final analysis. List of factors along with their respective loadings are given in Table III.

Hypotheses testing

This section provides results of hypotheses testing. Figure 2 represents the overall research model's results of regression analysis along with beta coefficients and significance values.

Human- and system-oriented KM strategies and KM process capabilities. H1 and *H2* are tested by using multiple regressions to examine the effect of KM strategies on KM process capabilities. Table IV shows the impact of system-oriented strategy on KM process capabilities as a whole ($\beta = 0.235$, $p < 0.05$). However, as the table shows, the impact of systems strategy on components of KM process capabilities is significantly present only for internalization process ($\beta = 0.418$, $p < 0.01$). On the other hand, human strategy has no significant relationship with any of the KM process capabilities.

KM strategies and organizational creativity. The third hypothesis represents the relationship between KM strategies and organizational creativity; regression results are deployed in Table V. The model strength is reported through R^2 (0.064), and it is found that system-oriented strategy is significantly positively associated with organizational creativity ($\beta = 0.386$, $p < 0.01$). It is also found that human-oriented strategy has a significant negative relationship with organizational creativity ($\beta = -0.179$, $p < 0.100$).

KM strategies and organizational performance. The fourth hypothesis examines the relationship between KM strategies and organizational performance. As can be seen in Table VI, the impact of KM strategies on organizational performance is only significant for systems strategy. However, it is found that human-oriented strategy component of KM strategy does not have significant impact on organizational performance.

KM process capabilities and organizational creativity. The fifth hypothesis of this study examines the relationship between KM process capabilities and organizational creativity. The model strength is reported by R^2, that is, 0.480 (Table VII). The regression results show that accumulated KM process capabilities have a significant positive impact on organizational creativity. Furthermore, it is found that out of four sub-constructs of KM capabilities, socialization is not significantly affecting organizational creativity. Three sub-components, that is, externalization, combination and internalization, have a significant relationship with organizational creativity. It however is surprising that combination has a significant negative relationship ($\beta = -0.137$, $p < 0.100$).

Factors with scale items	Factor loading				
KM systems strategy					
In our company, knowledge like know-how, technical skill or problem-solving methods is well codified	0.767				
In our company, knowledge can be acquired easily through formal documents and manuals	0.776				
In our company, results of projects and meetings are documented	0.663				
In our company, knowledge is shared in codified forms like manuals or documents	0.673				
KM human strategy					
In our company, knowledge can be easily acquired from experts and co-workers		0.592			
In our company, it is easy to get face-to-face advice from experts		0.800			
In our company, informal conversations and meetings are used for knowledge sharing		0.814			
In our company, knowledge is acquired by one-to-one mentoring		0.811			
Knowledge creation processes					
Socialization					
Our company stresses gathering information from sales and production sites			0.523		
Our company stresses sharing experience with suppliers and customers			0.534		
Our company stresses engaging in dialogue with competitors			0.723		
Our company stresses finding new strategies and market opportunities by wandering inside the firm			0.598		
Our company stresses creating a work environment that allows peers to understand the craftsmanship and expertise			0.609		
Externalization					
Our company stresses creative and essential dialogues				0.725	
Our company stresses the use of deductive and inductive thinking				0.739	
Our company stresses the use of metaphors in dialogue for concept creation				0.746	
Our company stresses exchanging various ideas and dialogues				0.671	
Our company stresses subjective opinions				0.720	

(*continued*)

Table III. Factor analysis

Factors with scale items	Factor loading				
Combination					
Our company stresses planning strategies by using published literature, computer simulation and forecasting	0.575				
Our company stresses creating manuals and documents on products and services	0.754				
Our company stresses building databases on products and service	0.740				
Our company stresses building up materials by gathering management figures and technical information	0.737				
Our company stresses transmitting newly created concepts	0.730				
Internalization					
Our company stresses enactive liaison activities with functional departments by cross-functional development teams		0.602			
Our company stresses forming teams as a model and conducting experiments and sharing results with entire departments		0.646			
Our company stresses searching and sharing new values and thoughts		0.717			
Our company stresses sharing and trying to understand management visions through communications with fellows (Removed)					
Organizational creativity					
Our company has produced many novel and useful ideas (services/products)			0.655		
Our company fosters an environment that is conductive to our own ability to produce novel and useful ideas (services/products)			0.801		
Our company spends much time for producing novel and useful ideas (services/products)			0.766		
Our company considers producing novel and useful ideas (services/products) as important activities			0.792		
Our company actively produces novel and useful ideas (services/products)			0.790		
Organizational performance					
Compared with key competitors, our company is more successful					0.694
Compared with key competitors, our company has a greater market share					0.768
Compared with key competitors, our company is growing faster					0.820
Compared with key competitors, our company is more profitable					0.860
Compared with key competitors, our company is more innovative					0.827

Table III.

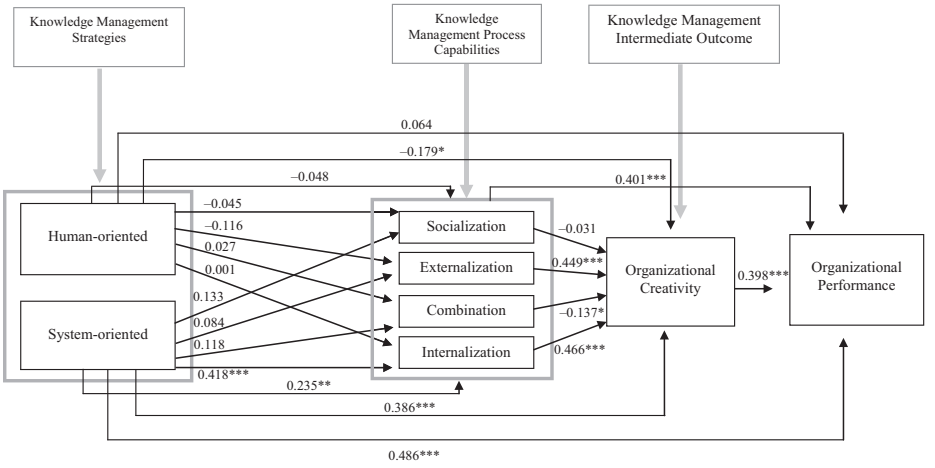

Figure 2.
Regression analysis

Organizational KM processes and organizational performance. In *H6*, the impact of KM processes on organizational performance was examined. Results of regression are summarized in Table VIII. Results show that KM processes on the whole have a significant positive impact on organizational performance ($\beta = 0.401$; p-value $= 0.000$).

Organizational creativity and organizational performance. H7 examines the impact of organizational creativity on organizational performance. Results of regression are summarized in Table IX. Results show that organizational creativity has a significant positive impact on organizational performance ($\beta = 0.398$; p-value $= 0.000$).

Discussion

The first two hypotheses probed into the relationship between human-oriented KM strategy, system-oriented KM strategy and KM process capabilities. Human-oriented KM strategy represents the use of interaction among organizational employees to create, share and transfer knowledge. In this study, it is found that human-oriented KM strategy has no significant impact on KM processing capabilities, whereas system-oriented KM strategy has a significant positive impact on KM process capabilities. Consequently, it leads to the conclusion that sample organizations for this study do not have stronger implications for human-oriented KM strategy. The presence and use of IT system and applications in an organization influences KM processing (Kim and Lee, 2006); therefore, it provides a support for system-oriented KM strategy.

It is the organizational context that serves as a base that shapes KM process capabilities. Organizational knowledge can be categorized as tacit and explicit, where KM processing capabilities have different impact for each of these knowledge categories. Human-oriented KM strategies are supportive of tacit knowledge because this strategy is related to socialization of employees, and relies on their interaction to create and transfer knowledge. However, human-oriented KM strategy can be ineffective because of difficulties embedded in organizational context like language, value, distance, perception, trust, rewards and values (Haldin-Herrgard, 2000).

The human- and system-oriented strategies are both related to organizational creativity because both strategies support knowledge processing behaviors in the

Table IV.
Multiple regression results of KM strategies and KM process capabilities

Variables	KM process capabilities ($F = 5.031$*, $R^2 = 0.039$)	Socialization ($F = 1.541$, $R^2 = 0.005$)	Externalization ($F = 1.319$, $R^2 = 0.003$)	Combination ($F = 1.727$, $R^2 = 0.007$)	Internalization ($F = 21.753$***, $R^2 = 0.167$)
System strategy	$t = 3.114$** $\beta = 0.235$	$t = 1.753$ $\beta = 0.133$	$t = 1.107$ $\beta = 0.084$	$t = 1.545$ $\beta = 0.118$	$t = 6.053$*** $\beta = 0.418$
Human strategy	$t = -0.633$ $\beta = -0.048$	$t = -0.589$ $\beta = -0.045$	$t = -1.524$ $\beta = -0.116$	$t = 0.353$ $\beta = 0.027$	$t = 0.011$ $\beta = 0.001$

Notes: ***$p < 0.01$; ****$p < 0.05$; *$p < 0.1$

organizations. System-oriented strategy is based on knowledge codification through the use of IT and computer systems. The availability of IT systems for codification process enables an organization to share and integrate organization-wide knowledge and, hence, facilitate new way of thinking and novel approach toward problem solving. Codification of knowledge through IT support makes knowledge accessible to all employees at all times; consequently, employees can use various tools, processes and techniques, resulting in new approaches to solve issues on hand (Bharadwaj and Menon, 2000).

The human-oriented strategy also paves the path for creativity by fabricating a web of interactions through which knowledge flows and new ideas emerge. Current study, however, finds a negative significant impact of human-oriented strategy on organizational creativity. Although it is an aberration from previous studies, it is to be noted that organizational creativity is influenced by individual's attitude toward creativity (Mostafa and El-Masry, 2008), social and cultural support (Davis, 1999),

Variables	Organizational creativity ($F = 6.860$***, $R^2 = 0.064$)
System strategy	$t = 3.654$***
	$\beta = 0.386$
Human strategy	$t = -1.960$*
	$\beta = -0.179$

Notes: ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Table V. Regression results of KM strategies and organizational creativity

Variables	Organizational performance ($F = 10.705$***, $R^2 = 0.050$)
System strategy	$t = 5.501$***
	$\beta = 0.486$
Human strategy	$t = 0.758$
	$\beta = 0.064$

Notes: ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Table VI. Regression results of KM strategies and organizational performance

Variables	Organizational creativity ($F = 34.816$***, $R^2 = 0.408$)
Socialization	$t = -0.352$
	$\beta = -0.031$
Externalization	$t = 5.887$***
	$\beta = 0.449$
Combination	$t = -1.735$*
	$\beta = -0.137$
Internalization	$t = 6.683$***
	$\beta = 0.466$

Notes: ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Table VII. Regression results of KM process capabilities and organizational creativity

organizational hierarchy (Kwasniewska and Necka, 2004), etc. In other words, if an organization's human-oriented strategy of KM is not supported by individual's attitude, cultural support and workplace climate, then the organization will not be able to reap any benefits from people's social interaction and knowledge creation and sharing aim.

Organizational performance is the corner stone around which all organizational efforts revolve. This study found that system-oriented KM strategy is significantly instrumental to organizational performance; however, human-oriented strategy is not instrumental toward organizational performance. Through system-oriented KM strategy, a firm is able to create, codify and store important knowledge in a database system, hence integrating competitive strategy and knowledge strategy (Ju *et al.*, 2006). It is this integration of system strategy with knowledge strategy that gives a firm an ability to design better solutions for customers and, hence, increase their market share.

The relationship of KM process capabilities is also critical for its implications toward organizational creativity. Interplay of knowledge processing capabilities establishes the pattern that influences creation of new knowledge, hence affecting organizational creativity and innovation. This study finds externalization and internalization to be significantly related with organizational creativity; combination is found to have a significant negative relationship, whereas socialization does not have any significantly association with organizational creativity. Through externalization process, tacit knowledge is converted into explicit knowledge, making it easier to understand, change and integrate (Dyck *et al.*, 2005). Consequently, people are able to give new meanings to knowledge on hand and explore novel uses of such knowledge. Because it is also found that system-oriented KM strategy is positively significantly related with creativity, it seems logical that externalization process is also positively related with creativity.

The process that involves using shared experiences to create tacit knowledge is called socialization (Nonaka, 1994). Current findings on socialization indicate that sampled organizations in current study do not have socialization significantly influencing organizational creativity. Previous research indicates that high degree of centralization negatively influences socialization (Lee and Choi, 2003), consequently weakening its impact on creativity. Socialization is connected with theories of organizational culture

Table VIII.
Multiple regression results of KM processes and organizational performance

Variables	Organizational performance ($F = 37.926$***, $R^2 = 0.209$)
KM process capabilities	$t = 6.139$*** $\beta = 0.409$

Notes: ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

Table IX.
Multiple regression results of organizational creativity and organizational performance

Variables	Organizational performance ($F = 38.926$***, $R^2 = 0.154$)
Organizational creativity	$t = 6.239$*** $\beta = 0.398$

Notes: ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$

(Nonaka, 1994), therefore relating socialization-based learning in human interaction and work place values.

Similarly, it is found that internalization process is significantly positively related with organizational creativity. Through internalization process, an organization converts explicit knowledge into tacit knowledge. A positive association between internalization and creativity means that codified knowledge is instrumental toward novel thinking and idea generation. There are, however, aberrant results for combination process and organizational creativity. The relationship in this study is found to be negatively significant. A possible explanation rests on the assumption that a lack of means for amplification of explicit knowledge does not allow an organization to maximize the benefit from combination stage of KM process capabilities. In other words, lack of procedures and culture that allows dissemination of knowledge to all systems of an organization hinders creative and novel use of existing knowledge.

This hypothesis reveals a significantly positive direct impact of KM process capabilities on organizational performance. This result is consistent with previous studies, where a positive independent impact of KM processes has been identified on organizational performance (Lee and Choi, 2003). KM processes allow organizations to create, share, disseminate, acquire and utilize knowledge that further enable organization to perform better in the competition. For organizations working in relatively more knowledge-intensive industries, the creation and sharing of new knowledge becomes a vital source of competitive advantage.

The last hypothesis explained the impact of organizational creativity on organizational performance. Organizational creativity enables a firm to create new products and services (Moorman and Miner, 1997), which can attract customers with innovative product solutions. In this way, the company can also increase its sales and, hence, profitability (performance). The previous research also indicates that creativity leads to better designing and implementation of strategy, which leads to better business performance (Hassan *et al.*, 2013). Creativity adds to organizational performance in multiple ways, that is, by adding new features to products, by making products more efficient, by reducing cost, etc. Consequently, the differentiation and added performance of products and services lead to higher market share and increased organizational performance.

Conclusion

Knowledge is appearing as a strategic resource for the organizations operating in the twenty-first-century dynamic environment. To achieve improved organizational performance and sustainable competitive advantage, KM initiatives seem pivotal. In this regard, this study examines relationships between KM strategy, KM processes, organizational creativity and organizational performance. This study reveals that:

- system-oriented strategy has a significant positive impact on KM process capabilities in general and internalization in particular;
- human-oriented strategy has no significant relationship with any of the KM process capabilities;
- system-oriented strategy has a significant positive impact on organizational creativity and organizational performance;

- human-oriented strategy has no significant relationship with organizational creativity and organizational performance;
- two KM process capabilities, that is, externalization and internalization, have a significant positive impact on organizational creativity;
- KM process capabilities have an accumulative positive significant impact on organizational performance; and
- organizational creativity has a significant positive impact on organizational performance.

Managerial implications

The results of this study have some important implications for managers as well as for theorists when attempting to achieve organizational creativity and performance through KM strategies and processes. First, there is clear evidence that integration of knowledge strategy and KM processes enhance organizational creativity and performance. However, in case of Pakistan, organization and its members are more inclined toward the management of explicit knowledge, instead of tacit knowledge. This suggests organizations to invest more in IT infrastructure and supporting software that enable members to create, share and store knowledge in organizations. Organizations need to train people if want to take advantage of tacit side of knowledge. Further, the role of different KM processes in also highlighted. Organizations wishing to enhance creativity and performance need to focus on the proper involvement of employees in different KM processes. From systems theory perspective, organizational creativity and performance should be conceptualized as a type of systematic effort which takes place as a result of integration between different KM strategies and processes.

Limitations and future research

Like any other study, this research contained few limitations which a reader should be aware of. First, as this study used a relatively small sample size, so findings should be generalized with caution. Second, the respondents of this research were drawn from managerial levels assuming that they would be more familiar with KM strategies and processes in their respective organizations. Chances are there that all the respondents would not be on same level in terms of their understanding of KM. Future research should be conducted in specific industries/sectors to create sector-specific customized knowledge regarding the role of KM in organizational creativity and performance. Cross-cultural and organizational differences should also be considered in future studies. Finally, more studies should be conducted to revalidate this study's findings.

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