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Enablers and processes for effective knowledge management

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Abstract

Purpose – The purpose of this paper is to attempt to assist firms in applying knowledge management (KM) through developing an integrated model which considers knowledge enablers, knowledge circulation processes (KCP), and job performance.

Design/methodology/approach – This study utilizes a questionnaire technique to validate the proposed integrated model. Structural equation modeling also validated the model.

Findings – All dimensions in the construct of organizational culture positively impact KCP. However, the formalized organizational structure appears to have a positive impact on KCP, while the autonomous organizational structure did not. This study also finds that KCP has a positive impact on both task outcomes and contextual job performance.

Research limitations/implications – The integrated model, which served to examine the impact of KM enablers on KCP, from the standpoints of organizational culture and organizational structure, along with the impact of KCP on job performance, has improved understanding of the relationships among KM enablers, KCP, and job performance.

Practical implications – Firms should carefully consider methods for adjusting internal structural designs or institute various mechanisms to promote the use of KM to maintain the organization's long-term competitive advantage.

Originality/value – The model contributes to firms' understanding the influence of knowledge enablers on KCP, and provides a KM performance index for assessment of individual performance. Research results can provide enterprises with guidance for implementing initiatives for KM initiatives.

Keywords Organizational culture, Organizational structure, Job performance, KM enablers, Knowledge circulation process (KCP), Knowledge management (KM)

Paper type Research paper

1. Introduction

Coupled with the development and wide use of the internet and information technology in recent years, knowledge is increasingly at the heart of modern enterprises, and managers are faced with the challenge of optimizing the integration of organizational resources to ensure effective development, transmission, and retention of critical knowledge (Holsapple and Wu, 2011). Thus, as the resource-based view (RBV) of knowledge management (KM) suggests that firms need to consider the technology, the people, and the organizational infrastructure when developing, implementing, and managing KM systems (KMS) to reap long-term strategic benefits (Meso and Smith, 2000;

Moran and Meso, 2008; Moustaghfir and Schiuma, 2013). However, RBV does not clarify
the avenue by which informational assets become useful resources.

Prior studies identified that systematically managing knowledge enablers allows
enterprises to effectively integrate the operation model of KM (Alavi and Leidner,
2001; Chen and Chen, 2005; Ho, 2009; Lee *et al.*, 2005; Whelan and Carcary, 2011).
As the ecological view of KM indicates, a well-established KMS relies not only on
technology, but also social ecology, such as culture, process, and structure (Gupta and
Govindarajan, 2000). This view also considers that taking a process approach can
better explore the knowledge of ecological systems of firms (Chen *et al.*, 2010).
However, the impact of knowledge enablers on the operation of organizational KM
processes still remains largely unexplored. Therefore, this study adopts the process
view to explore knowledge enablers' abilities to improve KM performance.

Based on knowledge circulation processes (KCP) including knowledge creation,
knowledge accumulation, knowledge sharing, knowledge utilization, and knowledge
internalization (Lee *et al.*, 2005), exploration of KM processes in conjunction with
knowledge enablers allows measurement of KM performance by KCP, based on specific
tasks and contextualized performances of individuals at an organizational level. KCP has
further application by individuals to improve job performance (Lee and Donohue, 2012).
Overall, the purpose of this study is to develop an integrated model which considers
knowledge enablers, KCP, and individuals' job performances to direct firms' effective
application of KM.

2. Literature review

From the RBV of KM, organizational KMS (OKMS) is a strategic assets for firms
(Meso and Smith, 2000; Moran and Meso, 2008; Moustaghfir and Schiuma, 2013).
To reap long-term strategic benefit from OKMS, firms should adapt the broader
socio-technical view when developing, implementing, and managing KMS. This suggests
that firms should consider not only the technology, but also the organizational
infrastructure and the people who form the KMS. However, these conditions do not clarify
such knowledge assets' becoming useful resources. From the ecological view of KM,
organizations are "knowledge ecological system" including four ecological dimensions
(i.e. knowledge distribution, interaction, competition, and evolution) (Chen *et al.*, 2010).
This perspective suggests adopting a process approach can better explore the knowledge
ecological systems of the firms. As Gupta and Govindarajan (2000) indicated, a well-
established KMS relies not only on technological infrastructure, but also social ecology,
such as culture, process, and structure. Therefore, this current study adopts the
process view to explore the impact of KM enablers on the operation of organizational KM
processes. This study adopts Lee and Choi's (2003) conceptual framework, which provides
a holistic view of KM through the application of systems thinking (Figure 1).

2.1 KM enablers

In Andersen and the American Productivity and Quality Center (APQC) (1996)
proposed the concept of the KM enabler. Since knowledge is equivocal, it has deep roots

Source: Lee and Choi (2003)

Figure 1.
Conceptual framework
for studying KM

in an organization's culture and usually appears in varied forms, such as experience and know-how of individual employees. Thus, as indicated by Lee and Choi (2003), culture is the most important success factor for organizational knowledge, while the organization's shared vision is the most critical component of culture (Gold *et al.*, 2001), which not only provides the organization with a clear direction and goals for all stakeholders, but also facilitates organizational change for achieving future goals.

Organizational regulations affect employees' perceptions of organizational operations, thus affecting individual's performance. The organizational structure, usually formed on the basis of organizational operations, can either encourage the KM operation in the organization, or become a hindrance (Lee and Choi, 2003). Flexibility in the organizational structure can promote knowledge sharing within an organization, along with knowledge operations across the boundaries separating all organizational stakeholders (Gold *et al.*, 2001; Nahm *et al.*, 2003). A knowledge-friendly culture and flexible organizational structure facilitate implementation of KM practices (Davenport and Prusak, 1998).

2.2 KM processes

KM processes refer to the use of the most efficient method to "transform" the implicit, fragmentary and private knowledge of individuals or groups both within and without the organization into valuable intellectual assets for the organization. These assets become methods to further enhance the organization's competitive advantages (Holsapple and Wu, 2011). Consequently, a knowledge creation spiral arises thus among individuals, groups, and the organization through the integrated activities of socialization, externalization, combination, and internalization (SECI) (Nonaka and Takeuchi, 1995). Knowledge transfer occurs from individual(s) to group(s), from group to group, and from group(s) to organization. Knowledge application stresses that competitive advantage relies on utilization of specific resources, rather than the quantity of resources the organization controls.

Alavi and Leidner (2001) proposed KM processes, which carefully consider the processes of managing organizational knowledge, but stressed the positive effects of IT-based systems or KMS on individual and organizational performance throughout the KM process. Given large degrees of system variation, the Alavi and Leidner's approach has difficulty providing generalized criterion to effectively measure individual or organizational KM performance. Despite prior studies proposing various dimensions for KM processes and adequate explanation of the contents of KM processes, these studies fail to adequately measure KM performance (Choy, Yew and Lin, 2006; Nonaka and Takeuchi, 1995; Andersen and APQC, 1996; Gold *et al.*, 2001).

Notably, Lee *et al.* (2005) proposed five different indicators in processes with which managers detect and understand the organization's KM operational situation. During the knowledge creation process, individuals need a clear understanding of the task and the information before creating knowledge from different sources in the organization. Individuals should also be able to share organizational core and general knowledge through KMS. In brief, increasing KCP efficiency and knowledge-intensity allows organizations to continuously create new knowledge and new competitive advantages. Increased KCP flow accelerates knowledge creation, accumulation, sharing, utilization, and internalization (Lee and Choi, 2003) (Table I).

2.2.1 Organizational culture and KM process. Organizational culture represents a critical success factor for KM (Alavi *et al.*, 2006; Davenport and Prusak, 1998;

Process	Items	Content
Knowledge creation	Tasks understandings	Extent of understanding of the task through the assistance and interaction with predecessors
	Information understandings	Extent of understanding of personally acquired information
Knowledge accumulation	Database utilization	Extent of employees' search through corporate databases to obtain knowledge required for given tasks
	Systematic management of task knowledge	Extent to which knowledge need for given tasks (including legal guidelines and task-related policies) is systematically stored for further usage
	Individual capacity for accumulation	Extent to which employees' personal knowledge and education results are formally or informally stored
Knowledge sharing	Core knowledge sharing	Extent of sharing information and knowledge relevant to core abilities for improving task efficiency
	General knowledge sharing	Extent of sharing general information and knowledge about the organization with internal and external teams
Knowledge utilization	Degree of knowledge utilization in the organization	Extent to which organization-wide information and knowledge are used to facilitate processing tasks or to perform tasks within teams
	Knowledge utilization culture	Extent to which employees are encouraged to utilize existing knowledge through a reward mechanism
Knowledge internalization	Capability to internalize task-related knowledge	Extent to which employees can obtain knowledge for task mastery and to produce new knowledge from learning and applying best practices
	Education opportunity	Extent to which university-administered education and on-job training is provided to enhance employee adaptability for task completion
	Level of organization learning	Extent to which the organization-wide standards for information resources and professional knowledge are systematically managed and regularly updated

Source: Lee *et al.* (2005)

Table I.
KCP measurement items

Lee and Choi, 2003; Somech and Drach-Zahavy, 2013; Zheng *et al.*, 2010). Prior studies indicated that organizational culture influences the outcomes of KM process due to social interactions among individuals whose knowledge creation and sharing behaviors and consequent actions which organizational regulations control (Alavi *et al.*, 2006; Borgatti and Cross, 2003; Lee and Choi, 2003). Trust among individuals facilitates the creation of a culture of caring (Lee and Choi, 2003). On the other hand, care leads to trust, which increases willingness to share insights and expertise with others (Alavi *et al.*, 2006). The motivation from care for others encourages individuals to improve their KM capabilities within the organization and to more proactively share knowledge. At this stage, every individual in the organization becomes more creative, thus enhancing the organization's overall ability to apply KM practices. Enhancing the innovative capabilities and expertise of individual workers further reinforces the organization's culture of caring, thus producing and sustaining cyclical and effective KM processes (Alavi *et al.*, 2006).

Collaboration is the level of willingness that individuals exhibit to support each other (Lee and Choi, 2003) but is not achievable by a small number of individuals. Successful knowledge generation requires the joint efforts and collective wisdom of all the members of an organization. In addition, collaboration requires the continuous exchange of knowledge, skills, ideas, and values. At the same time, cooperation creates enthusiasm for knowledge sharing, and interest in acquiring valuable knowledge and expertise from other members (Borgatti and Cross, 2003). Therefore, this study proposes *H1-1*:

H1-1. Collaboration has a positive impact on the KCP.

Trust is an important concept in theories of social exchange, and represents mutual faith in other's good intentions and behavior (Lee and Choi, 2003). In an organization, employees compare care and assistance provided by supervisors and colleagues with standards if expectation exceeding these standards results in increased trust for the relationship. Trust is also a requirement for knowledge exchange, and forms the basis for knowledge sharing (Davenport and Prusak, 1998). When colleagues trust each other, and trust managers and organizations, they become more willing to participate in the exchange of knowledge (Hassan and Semerciöz, 2010). Also, a concrete and comprehensive trust assists eliciting behavior that facilitates knowledge sharing (Davenport and Prusak, 1998). Therefore, a positive relationship constructed on trust will be beneficial to the circulation of knowledge within the organization. Therefore, this study proposes *H1-2*:

H1-2. Trust has a positive impact on the KCP.

Learning represents the acquisition of new knowledge (Borgatti and Cross, 2003). Since KM itself can be a type of learning process, the organization should provide employees with both formal and informal methods of learning, thereby allowing employees to actively participate in KM, including knowledge sharing and application. An organization which develops a deep-rooted learning culture and provides different learning tools can develop as a learning organization (Zheng *et al.*, 2010). A learning culture in the organization will encourage employees to accept changes, continue learning, pursue innovation, and become KM enablers (Alavi *et al.*, 2006). Therefore, this study proposes *H1-3*:

H1-3. Learning exercises positively impact the KCP.

Innovation consists of a series of cognitive activities, a process-integrating knowledge creation and complex, continuous, unique, new, and unexpected activities (Mascitelli, 2000). Nonaka and Takeuchi (1995) asserted that the phases of actualizing an innovative concept include the generation of an innovative idea, concept development, and the development of a marketing strategy. Specifically, organizational innovation refers to the methods an organization uses to successfully stimulate employee creativity, and then leverage the benefits of this creativity to increase organizational competitiveness. Therefore, employees use existing knowledge to generate innovation, resulting in new knowledge, subsequently applied by other members of the organization for use as reference for problem solving. Continuously applying this process raises the effectiveness of the KCP, thus increasing the rate at which knowledge spreads throughout the organization. Therefore, this study proposes *H1-4*:

H1-4. Innovation has a positive impact on the KCP.

Learning organizations should demonstrate expertise, and advancement should be based not on seniority, but on the extent of the employee's professional knowledge and willingness to share, rather than seniority (Alavi *et al.*, 2006). A sense of equality among all employees, promoted in the organization affords personnel with particular expertise the confidence to freely express specialized views, thus accelerating knowledge sharing (Yeh *et al.*, 2011). In other words, recognition of the employee's expertise or professionalism elevates professional status, encouraging the sharing knowledge with others. This approach encourages all employees to pursue and share knowledge as much as possible, thus improving overall KM performance (Alavi *et al.*, 2006). Therefore, this study proposes *H1-5*:

H1-5. Expertise exerts a positive impact on the KCP.

2.2.2 Organizational structure and KM process. Organizational structure refers to the formal rules, tasks, functions, and authorities that exist within an organization, including policies, processes, hierarchic relationships, reward systems, sector boundaries, and so on (Gold *et al.*, 2001). Prior studies noted that centralization and formalization serve important foundations for building organizational structures, which represent the level of control of policy makers (Lee and Choi, 2003; Nahm *et al.*, 2003; Pierce, 2012). Categorization of organizational structures is according to degrees of centralization and formalization.

A highly centralized organization requires employees to follow a specific communication channel. However, this avenue prolongs decision making, restricts internal transmission of information, and suppresses creative solutions (Lee and Choi, 2003). Contrarily, decentralized management disperses authority to the point of sub-groups' autonomy, and offers opportunities to promote idea creation or to share ideas, further encouraging the creation of knowledge (Lee and Choi, 2003). In terms of autonomy, decentralized management allows employees to complete important tasks independently and effectively within the organization (Nonaka and Takeuchi, 1995). Employees are thus given a degree of autonomy for discharging responsibilities, and are then further encouraged to appropriately use KM to complete assigned tasks, thus improving the rate and effectiveness of the circulation flow of knowledge within the organization. Therefore, this study proposes *H2-1*:

H2-1. Autonomy has a positive impact on the KCP.

Formalization refers to the degree to which formal provisions, procedures, and standard policies control the organization's decision making and working relationships (Lee and Choi, 2003). However, as the organization motivates individual employees to complete assignments through formalized policies, the operation of KM reduces to formalities, to the detriment of KCP. Contrarily, in a less-formalized organization, individual initiative enables the viability of KM (Lee and Choi, 2003). Since KM operations includes sharing, using, and creating new knowledge, organizational flexibility can improve the conditions for knowledge creation (Gold *et al.*, 2001), and reducing the formality of the organizational structure can improve opportunities for communication and interaction within the organization (Nonaka and Takeuchi, 1995). Therefore, this study proposes *H2-2*:

H2-2. Formalization has a negative impact on the KCP.

2.3 KM processes and job performance

Among the many methods developed for measuring organizational performance, the best known is the balanced scorecard (BS) developed by Kaplan and Norton (1996). However, in BS, the financial dimension generally has an indirect and slow influence on KM performance, and the causal relationship is difficult to track. Contrarily, the SECI model focusses on individual learning, and emphasizes that knowledge is the creation of individuals who exchange different types of knowledge and content (i.e. exchanging implicit knowledge makes it explicit), and then spread those through groups and organizations (Lee and Choi, 2003; Yeh *et al.*, 2011). However, although SECI provides organizations with the theoretical foundation for the creation of knowledge, it lacks operational variables applicable to knowledge creation, and can only serve as a conceptual guideline in the organization.

Thus, KM processes have a significant impact on job performance at the organizational level (Chen and Chen, 2005; Lee *et al.*, 2005). Lee and Choi (2003) specify two aspects of performance measurements regarding KM within organizations. The first focusses on productivity, assessing the effectiveness of organizational KM investment in the areas of the management processes, goal achievement, and rate of return. The second focusses on knowledge by assessing the effectiveness in achieving strategic goals, efficiency of KM implementation, and guidelines for improving follow-up actions (Chen and Chen, 2005). Evaluations of KM performance can have a basis in KCP (Lee *et al.*, 2005), which includes processes of knowledge creation, storage/ retrieval, transfer, and application. KCP can also measure how individuals create, accumulate, share, utilize, and internalize knowledge (Lee *et al.*, 2005). Overall, the current study focusses on the flow of knowledge within an organization, and uses the Lee *et al.* (2005) concept of KCP to measure individual's job performance of KM processes through an organizational-level evaluation of KM performance. This study seeks to discover methods of improving an individual's job performance through KM initiatives instituted at the organization level.

Successfully performing tasks encompasses not only the practical results of an individual's efforts (task performance), but also the supportive environments and psychological factors (contextual performance) present in the organization. Task performance means behavior directly or indirectly related to an organization's technical core, that is, the result of work done by an individual directly related to the tasks specified or desired by the organization (Motowidlo and Van Scotter, 1994). Contextual performance refers to behavior in organizational, social, and the psychological contexts

necessary for supporting the operation of core technologies (Lee and Donohue, 2012). In addition, job performance is a better measure of productivity for KM processes (Lee and Donohue, 2012). Overall, the impact of KM processes on the organization depends on accomplished job performance. Therefore, this study proposes *H3-1* and *H3-2*:

H3-1. The KCP has a positive impact on task performance.

H3-2. The KCP has a positive impact on contextual performance.

The previous discussion provides the basis for the proposed the research model shown in Figure 2.

3. Methodologies
3.1 Participants
This study's participants, recruited from Taiwan-based enterprises, included middle- and upper-level managers, operational-level supervisors, technical engineers, and administrative staff who agreed to complete an online or paper-based questionnaire. Participants who completed the paper-based questionnaire were organizational personnel and attending a part-time graduate program. Those who completed online questionnaire constituted an artificially selected group intended to avoid deviation in the participants' managerial backgrounds. Finally, questionnaires, distributed and collected in 2008, produced 248 valid responses (a recovery rate of 79.49 percent).

3.2 Questionnaire design
The literature review, the development of research hypotheses, and the research model, guided the operational definitions of each construct proposed in this study (Table II). The questionnaire included five major sections according to the study's purposes and the research model: part I – demographics, part II – organizational culture, part III – organizational structure, part IV-KCP, and part V – job performance. Questions in parts II-V used a five-point Likert-type scale with 1 representing "strongly disagree" and 5 representing "strongly agree." In the design process, the content of all questions was thoroughly discussed with relevant academics and practitioners to enhance the face and content validity of the questionnaire. To avoid common method variance (CMV), this study adopted previously accepted preventative methods, such as distributing anonymous survey, designing each measurement item to be easily understand, inviting KM experts to advise development of measuring items, and conducting a pretest.
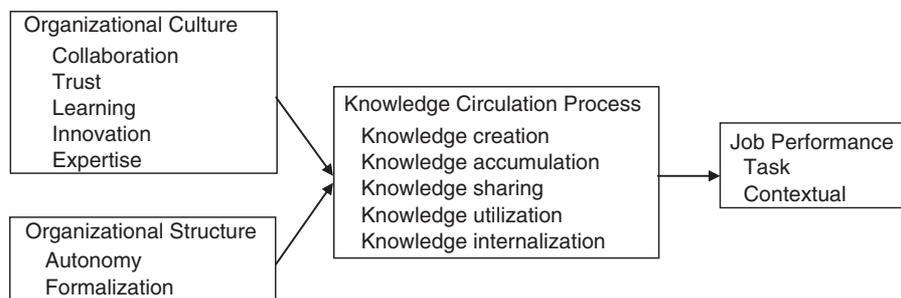

Figure 2.
Research model

Organizational culture – collaboration, trust, learning (Lee and Choi, 2003)

COL   Whether members of the company are willing to support and help each other

TRU   Whether mutual trust of the intentions and behaviors among members is established

LEA   Whether various satisfactory opportunities and encouragement provided for the employees by the company achieve learning and development

Organizational culture – innovation

INN   When pursuing innovation, whether the higher-level staff set up the basic orientation of the company, and mid-level staff members are responsible for its promotion and explanation

Whether the organization provides sufficient resources for employees to complete their tasks

Whether management skills at the organizational- and departmental-level promote innovation within the organization

Organizational culture – expertise

EXP   The extent of a person's anticipation of rewards for sharing his/her expertise with others

The extent to which a person believes that, by he/she can improve his/her relationship with others by sharing his/her expertise and knowledge

The extent to which a person is positively aware of his/her contribution to the organization

Organizational structure – autonomy, formalization (Lee and Choi, 2003; Nahm et al., 2003)

AUT   Whether the right of the employee to make independent decisions in performing his/her job that is, the extent to which employees are entrusted to make independent decisions concerning work plans, equipment usage, and work procedures

FOR   Whether a job or activity is subject to formalized procedures (formal provisions, procedures, standards, policies, etc.)

Knowledge circulation process – knowledge creation, accumulation, sharing, utilization, and internationalization (Lee et al., 2005)

KC   The extent of a person's understanding of his/her work task is improved by interaction with and assistance from colleagues from different backgrounds

The extent to which a person understands the information to be obtained

KA   Whether employees will use the database when they need job-related knowledge to assist in their decision making

Whether an organization uses formal methods to store organizational knowledge

Whether the employee's acquired knowledge is stored through formal or informal methods

KS   Whether sharing knowledge relevant to the company's core capability

Whether sharing company knowledge such as information and announcements

KU   Whether knowledge is used for work within the organization

Whether an organization encourages its employees to participate in a knowledge-oriented atmosphere

KI   Whether organization members are able to produce new knowledge through the knowledge they have obtained

Whether education and training are provided within the organization to help employees internalize knowledge

Whether the organization systematically helps its employees to quickly internalize knowledge

Job performance – task, contextual (Lee and Donohue, 2012)

TP   Behavior directly or indirectly related to the operation of the core technology (task performance) that is, the results of one's work

CP   Behaviors of the social and psychological environment required to support the operation of core technology

Table II.
Operational definitions of the variables

3.3 Data analysis

In this study, SPSS software examined each hypothesis in the measurement mode through the regression analysis. Visual partial least squares software including bootstrapping and jackknifing, detected the level of significance of the paths among

the constructs within the structural model. The paths should prove to be consistent with the expectations of the proposed hypotheses (Chin *et al.*, 2003).

4. Results
This study retrieved 248 valid responses (Table III). This study adopted the post-detection method to avoid CMV by conducting Harman's single-factor test, and found that the first principal component's cumulative explained variance is only 27.381 percent (<50 percent).

4.1 Reliability and validity checks
To measure the consistency, the analysis subjected each construct to reliability testing using Cronbach's α and composite reliability. Results show that Cronbach's α for all constructs exceeded 0.7 aside from knowledge creation and knowledge utilization, which exceeded 0.6. As suggested by Fornell and Larcker (1981), the CR value in each construct should be higher than 0.8 (Appendix). After removing outlying items, the survey instrument demonstrated good convergent validity since individual items demonstrate good reliability and AVE exceeded 0.5. The square root of AVE for individual constructs is also higher than the correlation of each dimension. Table IV shows that the AVE of each construct also exceeds 0.5. Finally, the cross-loading matrix shows that the variable in an individual construct is higher than that for other constructs, meaning that the variables are significantly different between constructs in the measurement model (Fornell and Larcker, 1981), and establishing overall discriminatory validity.

4.2 Hypothesis verification
As a result of a regression analysis, all dimensions in the construct of organizational culture achieve significance at the 0.05 level, indicating that the dimensions positively correlate with KCP. However, autonomy in the organizational structure does not have a significant positive correlation with KCP, but the assumption is that the formalization dimension negatively correlates with the KCP. Consequently, *H1-1-H1-5* gain support (notably, the α values of *H1-1* and *H1-2* are relatively lower than the others), while *H2-1* and *H2-2* do not gain support. A subsequent regression analysis examines the effects of all dimensions of KCP construct on individual job performance, and all

Industry type	Numbers (%)	Company size (persons)	Numbers (%)
Accounting and finance	25 (10.1)	Below 50	10 (4.0)
Government	14 (5.6)	51-100	4 (1.6)
Information services	30 (12.1)	101-500	18 (7.3)
Manufacturing	78 (31.5)	501-1,000	64 (25.8)
Medical services	4 (1.6)	1,001-5,000	63 (25.4)
Others	39 (15.7)	More than 5,000	89 (35.9)
Public utilities	26 (10.5)	*Position*	
Retail	29 (11.7)	High-level manager	3 (1.2)
Education	3 (1.2)	Middle-level manager	8 (3.2)
Total	248 (100.0)	Base-level manager	19 (7.7)
		Technician	125 (50.4)
		Administrative	57 (23.0)
		Others	36 (14.5)

Table III.
Participant distribution by industry, company size, and position

Dimension	COL	TRU	LEA	INN	EXP	AUT	FOR	KC	KA	KS	KU	KI	TP	CP	AVE
COL	*0.804*														0.646
TRU	0.624	*0.777*													0.604
LEA	0.373	0.465	*0.816*												0.666
INN	0.387	0.469	0.601	*0.763*											0.582
EXP	0.442	0.370	0.36	0.443	*0.716*										0.513
AUT	0.252	0.342	0.321	0.531	0.337	*0.758*									0.575
FOR	0.224	0.305	0.285	0.145	0.173	−0.88	*0.776*								0.602
KC	0.416	0.447	0.483	0.472	0.477	0.305	0.285	*0.726*							0.527
KA	0.369	0.361	0.374	0.349	0.466	0.212	0.285	0.536	*0.766*						0.586
KS	0.436	0.435	0.371	0.442	0.455	0.272	0.238	0.470	0.644	*0.808*					0.653
KU	0.423	0.421	0.555	0.559	0.442	0.300	0.312	0.543	0.535	0.630	*0.767*				0.588
KI	0.368	0.478	0.579	0.559	0.326	0.277	0.351	0.513	0.538	0.550	0.709	*0.825*			0.680
TP	0.348	0.301	0.312	0.443	0.471	0.147	0.156	0.495	0.446	0.506	0.463	0.502	*0.780*		0.609
CP	0.325	0.307	0.323	0.526	0.395	0.258	0.062	0.360	0.384	0.442	0.447	0.473	0.744	*0.789*	0.623

Notes: Italic numbers on the diagonal show square roots of the AVE; numbers below the diagonal show the correlations

Table IV.
Correlation matrix and
discriminant validity

dimensions have significant and positive correlations with job performance at a significance level of 0.05. Therefore, hypotheses *H3-1* and *H3-2* gain support. Figure 3 presents the path coefficients among the constructs and the test results. Table V summarizes the findings for each hypothesis.
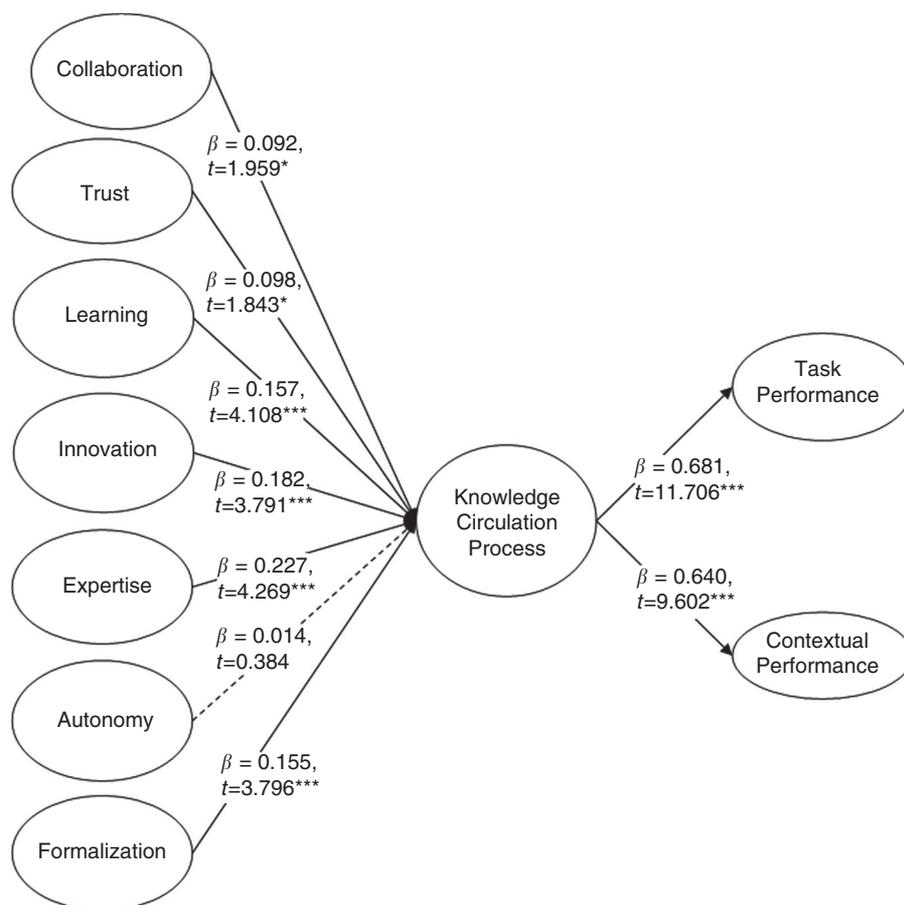
Notes: *p<0.15, **p<0.05, ***p<0.00

Figure 3.
Structural model

Hypothesis	Description	Result
H1-1	Collaboration has a positive impact on KCP	Supported
H1-2	Trust has a positive impact on KCP	Supported
H1-3	Learning exercises positively impact KCP	Supported
H1-4	Innovation has a positive impact on KCP	Supported
H1-5	Expertise has a positive impact on KCP	Supported
H2-1	Autonomy has a positive impact on KCP	Not supported
H2-2	Formalization has a negative impact on KCP	Not supported
H3-1	KCP has a positive impact on task performance	Supported
H3-2	KCP has a positive impact on contextual performance	Supported

Table V.
Summary of hypothesis verification

5. Discussions

5.1 The importance of organizational culture to KCP

This study demonstrates the impact of organizational culture on KM. The successful implementation of KM closely relates to organizational culture (Zheng *et al.*, 2010) and depends on a company's ability to transform its organizational culture into a knowledge-oriented culture (Alavi and Leidner, 2001). This study, coincidentally, found that organizational culture positively and significantly correlates with KCP. Whether in terms of collaboration, trust, or learning, both innovation and expertise can become KM enablers for promoting knowledge circulation within an organization. Among all factors, learning, innovation, and expertise have the strongest influence, indicating that employees should maintain a consensus to improve personal performance and capabilities, thereby enhancing the company's global and industrial competitiveness.

5.2 The importance of organizational structure for KCP

This study found that autonomy has no significant impact on KCP, while formalization has a significant and positive impact on KCP. Previous studies suggested that an important relationship exists between organizational structure and KM, and that combining produces maximum effect. In Taiwan, most companies have a pyramid-style organizational structure with limited and formalized communication networks. Such rigid hierarchies are not conducive to effective KM and related operations (Nahm *et al.*, 2003; Nonaka and Takeuchi, 1995; Pierce, 2012). These types of organizations are capable of formalized activities, but have difficulty in promoting individual autonomy, thus restricting the effectiveness of KCP. In fact, most organizational structures feature a mix of autonomy and formalization. As long as the organization allows for some flexibility in its formalized structure, knowledge-oriented individuals can have the autonomy needed for effective involvement in KCP to complete assigned tasks, and an organic structure easily result. This organic structure promotes KCP within the organization, and allows individual employees' involvement in decision making, since the organizational structure is characteristically less complex and highly flexible from features of integration. In addition, an organic structure is relatively decentralized, characteristics of freedom and flexibility, and individuals within such an organization gain encouragement to coordinate and cooperate with others through various communication networks. Overall, the appropriateness of a company's organizational structure is a very important issue, and firms should carefully consider adjustments to internal structural designs or institute various mechanisms to promote the use of KM to maintain the organization's long-term competitive advantage.

5.3 The influence of the KCP on job performance

This study determines that both task performance and contextual performance have significant and positive impact on the KCP. The implementation of KM not only confers substantial improvements on employees' performance, but also aids retention of specialized personal expertise and experience for dissemination among other members of the organization. Proficiency with the KMS allows employees to solve problems quickly and increase efficiency. In addition, KM promotes employees' initiative, focus, confidence to achieve personal advancement, and increased willingness to voluntarily engage in the improvement of KM activities for the benefit of the organization.

5.4 Academic and practical contributions

In this study, the integrated theoretical model improves understanding of the relationships among KM enablers, KCP, and job performance. The model serves to

examine the impact of KM enablers on KCP from the standpoints of organizational culture, organizational structure, and impact of KCP on job performance. This study finds that among KM enablers, dimensions of organizational culture, including collaboration, trust, learning, innovation, and expertise have a positive impact on KCP, while dimensions of organizational structure, including formalization also have a positive impact on KCP. These results provide enterprises with guidance for implementation of KM initiatives. In addition, this study proposes the use of the five KCP measurements for managers, suggested by Lee *et al* (2005), to better understand conditions conducive to successful KM implementation.

Finally, the theoretical model used in this study clarifies the qualities that can promote the successful implementation of KM in organizations. Managers must clearly understand the characteristics of their firms and must clearly articulate the KM outcomes sought. Then in a step-by-step process from the most fundamental enablers, such as organizational culture and structure, development of an operational context, suitable for KMS implementation to maximize the likelihood of success, can proceed. Moreover, the KCP model is repeatable for evaluating performance and instituting adjustments to maintain effective KM performance. KM is not simply constructing a system, but also building a number of invisible supportive elements. In the past, when companies in Taiwan implemented KM, they often mistakenly placed focus on the introduction of information tools rather than on organizational structure and cultural factors. Because many companies mistakenly assume that KM is simply another form of file management, employees can easily apply KMS, but without actually accomplishing KM. Furthermore, many companies limit the application of KMS to debugging work-place-related problems. Even worse, many companies have no specific or substantial rewards to encourage employees to share knowledge. Under such circumstances, unsurprisingly, many KMS initiatives fail to achieve desired results. On the other hand, western companies frequently use KMS to facilitate policy making, demand analysis, or trend prediction, and KM is widely practiced in various departments of the companies.

6. Conclusion
This study identifies the importance of organizational culture and structure as an influence on KCP, and on the tasks and contextual performance of individual employees. The construct of organizational culture includes collaboration, trust, learning, innovation, and expertise, all of which have a significant impact on KCP in terms of knowledge creation, accumulation, sharing, utilization, and internalization. The construct of organizational structure includes autonomy and formalization. However, given the pyramid-like structure of Taiwanese organizations, the formalized structure has an unexpectedly positive impact on KCP. Finally, this study finds that KCP has a positive impact on both performance of tasks and contextual performance. Consequently, a well-maintained KCP not only allows for sharing of individual expertise and knowledge, thus enhancing productivity and quality of corporate policies, but also increases the willingness of employees to improve themselves and the company. The findings provide guidance for organizations to improve KM practices.

This study has several limitations. First, primary participants in this study are largely not mid- and high-level supervisors who have experience managing individual and organizational knowledge, and thus the sample may be less than completely representative. Second, the relatively large number of variables considered resulted in a long questionnaire consisting of 85 items, which may reduce the quality and reliability

of responses, and thus, the survey's validity. Third, the questionnaire incorporated items which had to be translated into Chinese from foreign languages, raising potential issues of semantic fidelity, which may impact research results.

Several avenues for future research are worthy of exploration. In addition to the two KM enablers (organizational culture and structure) proposed here, other helpful enablers also warrant investigation. The model used in this study only cites generic KM enablers practicable in generalized organizations. However, enablers may differ with the characteristics of various industries. Thus, continued exploration of the impact of enablers in different types of industries is a recommendation and future research may also study the impact from other KM enablers on the sub-constructs of KCP.

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Appendix

Dimension	Descriptions	Mean (SD)	Loading	CR	α
COL	1. Members of our company are satisfied with the degree of mutual cooperation	3.71 (0.79)	0.8463	0.88	0.81
	2. Members of our company are able to help and support each other	3.92 (0.69)	0.8778		
	3. Members of our company are willing to cooperate between departmental units	3.70 (0.81)	0.7442		
	4. Members of our company are willing to bear responsibility for failure	3.38 (0.91)	0.7363		
TRU	1. Members of our company can trust the attitudes and behavior of other members	3.68 (0.68)	0.8035	0.88	0.83
	2. Members of our company can trust the ability of other members	3.70 (0.76)	0.8065		
	3. Members of our company trust that the efforts of other members aim toward achieving the company's goals	3.72 (0.78)	0.7892		
	4. Members of our company trust that the decisions of other members are based on the interests of the company (when personal and corporate interests conflict)	3.44 (0.81)	0.7435		
	5. The relationship between members of the company is built upon mutual trust	30.77 (0.79)	0.7416		
LEA	1. Our company provides many different types of formal training courses appropriate to our tasks	3.70 (1.03)	0.8182	0.89	0.83
	2. Our company encourages employees to participate in seminars and group discussions	3.65 (0.91)	0.8041		
	3. Our company encourages the development of various informal community groups	3.38 (0.95)	0.7957		
	4. Members of our company are satisfied with the extent of job training and self- development courses	3.33 (0.91)	0.8465		
INN	1. Our company encourages staff to put forward new ideas and speak freely	3.49 (0.87)	0.7077	0.89	0.91
	2. Creative work by employees will receive appropriate feedback and fair rewards	3.36 (0.91)	0.8038		
	3. Members of our company are free to determine the best way to accomplish a task	3.19 (0.92)	0.7075		
	4. Supervisors will adopt new management practices to motivate subordinates and improve morale	3.17 (0.92)	0.7162		
	5. Adequate human resources will be provided for the implementation of innovative ideas	3.12 (0.87)	0.8120		
	6. Adequate funding will be provided for the implementation of innovative ideas	2.98 (0.85)	0.8181		
	7. Reasonable time will be given for the implementation of innovative ideas	3.05 (0.86)	0.7832		
	8. Members of the company are willing to risk failure in pursuing innovation	2.96 (0.89)	0.7477		

(continued)

Table AI.
Reliability and
validity indices

Dimension	Descriptions	Mean (SD)	Loading	CR	α
EXP	9. Our company supports innovation and discourages internal competition	3.31 (0.95)	0.7285		
	5. Sharing my expertise with other members can help expand the scope of my interaction	3.74 (0.67)	0.7688	0.86	0.86
	6. Sharing my expertise with other members can potentially lead to cooperation with distinguished members	3.54 (0.74)	0.7217		
	7. Sharing my expertise with other members can help me to establish solid relationships with like-minded people	3.68 (0.73)	0.7172		
	8. Sharing my expertise can help other members solve problems	3.92 (0.60)	0.7060		
	9. Sharing my expertise can help create new business opportunities for the organization	3.40 (0.71)	0.6729		
	10. Sharing my expertise can help improve the work flow within the organization	3.65 (0.80)	0.7094		
	11. Sharing my expertise can help enhance the productivity of the organization	3.71 (0.70)	0.7457		
	12. Sharing my expertise can help the organization to achieve its objectives	3.84 (0.68)	0.7017		
AUT	2. In some cases, our company encourages members to make their own decisions	3.56 (0.80)	0.7134	0.84	0.75
	3. Members of our company may have their own unique way of doing things that does not require them to refer to others	3.00 (0.94)	0.7399		
	4. Members of our company perform routine task without having to ask their supervisors in advance (in line with job responsibilities)	2.91 (1.11)	0.7928		
	5. When implementing decisions, members of the company have room to make decisions independently (in accordance with their duties)	2.91 (1.03)	0.7846		
FOR	1. The majority of company activities are tailored through formalized procedures and regulations	3.79 (0.76)	0.7884	0.88	0.83
	2. Formal and planned arrangements must be made to handle communications with external contacts	3.71 (0.84)	0.7496		
	3. Rules and procedures within the company are generally available in plaintext	3.80 (0.80)	0.8610		
	4. In most cases, members of the company are required to refer to company rules and procedures when performing tasks	3.94 (0.66)	0.7754		
	5. The company does not comply with organizational norms or regulations when assessing its employees	3.63 (0.85)	0.6964		
KC	2. I was adequately trained by my predecessor(s) to assume my duties	3.60 (0.97)	0.7198	0.82	0.70
	3. I full understand the core knowledge of my work	3.68 (0.81)	0.7931		

(*continued*)

Table AI.

Table AI.

Dimension	Descriptions	Mean (SD)	Loading	CR	α
	4. Through brainstorming sessions, I can obtain useful information and recommendations without incurring excessive time cost	3.39 (0.89)	0.7353		
	7. I can find required information and properly use knowledge from company management				
KA	2. We try to preserve work-related expertise, techniques, and guidelines	3.67 (0.88)	0.6490	0.85	0.75
	3. We can use the management system to store required knowledge for future use	3.98 (0.59)	0.7510		
	4. We use a variety of methods (digital or analog) to store required knowledge	3.75 (0.76)	0.8137		
	5. We organize the results from management education and training, and save them for future reference	3.94 (0.68)	0.8108		
		3.73 (0.87)	0.6782		
KS	2. We use information systems to facilitate information/knowledge sharing and thus improve work efficiency	3.79 (0.75)	0.8462	0.85	0.73
	3. We share information and knowledge when working with other department(s)	3.60 (0.84)	0.7657		
	4. We utilize information systems (i.e. intranets, electronic bulletin boards, etc.) to share information/knowledge	3.80 (0.82)	0.8102		
KU	1. We promote teamwork through inter-departmental information and knowledge circulation	3.68 (0.79)	0.7136	0.81	0.65
	4. Our company encourages a culture of knowledge sharing (i.e. rewarding employees who have new knowledge, ideas, and/or suggestions)	3.40 (1.00)	0.7897		
	5. The company conducts research surveys and education training	3.74 (0.91)	0.7941		
KI	5. Our company provides education and training to raise employee proficiency at new work tasks	0.71 (0.90)	0.7290	0.89	0.84
	6. I can systematically manage my expertise and knowledge (i.e. customer knowledge, demand forecasting)	3.48 (0.88)	0.8167		
	7. The established standards for information resources, including data and knowledge are appropriate for use throughout the organization	3.44 (0.93)	0.8810		
	8. Professional knowledge and information are regularly updated and properly maintained within our company	3.44 (0.97)	0.8645		
TP	1. I work more efficiently than before	3.58 (0.77)	0.5258	0.88	0.83
	2. I believe that the knowledge management system can help enhance my productivity	3.68 (0.76)	0.8794		

(continued)

Dimension	Descriptions	Mean (SD)	Loading	CR	α
	3. The knowledge management system can help me to retrieve useful knowledge and find needed experts much more quickly	3.71 (0.78)	0.8424		
	4. The knowledge management system can enhance my professional competence and the quality of my decision making	3.69 (0.78)	0.8577		
	5. I feel that using the knowledge management system will save the company costs involved in transferring and educating personnel	3.76 (0.82)	0.7428		0.85
CP	1. I am willing to make the effort needed to use the knowledge management system to complete my work	3.31 (0.88)	0.7451	0.90	
	2. In using the knowledge management system, I am willing to take initiatives and provide useful advice to the company	3.58 (0.84)	0.8346		
	4. Using the knowledge management system enables me to provide constructive input in a systematic way	3.45 (0.77)	0.7202		
	5. Using the knowledge management system enables me to achieve self-growth	3.65 (0.81)	0.8031		
	6. In using the knowledge management system, I am willing to help and work with others	3.71 (0.82)	0.8368		

Table AI.

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