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Drivers of organizational knowledge management

Chuan-Chun Wu[1]*, Chien-Hsing Wu[2], Chang-Chun Li[3,4] and Teng-Hang Huang[1]

[1]Department of Information Management, I-Shou University, 1, Section 1, Hsueh-Cheng Road, Ta-Hsu Hsiang, Kaohsiung, Taiwan 840.
[2]Department of Information Management, National University of Kaohsiung. Taiwan, R.O.C.
[3]Department of Information Engineering I-Shou University, Taiwan.
[4]Department of Business Administration, KaoYuan University, Kaohsiung, Taiwan 840.

Most of knowledge management documents use a single dimension or individual case study as the foundation to carry out studies into management performance and the studies into how knowledge management performance influence knowledge management driver are very few. Consequently, this study integrated the theories from different studies to propose three individual drivers of knowledge management, and the knowledge management performance of organizations was the dependent variable. Through questionnaires, the mutual relationship between the three individual drivers of knowledge management would be discussed, and then the relationship between the drivers of knowledge management and the knowledge management performance in the organization would be discussed too. Two-step approach of Anderson and Gerbing (1988) was the main study method of this study, and SPSS statistical software was used to carry out reliability test and exploratory factor analysis, and assessment of validity and measuring model were then carried out. LISREL8.51 statistical software was used to carry out verification for the measuring model. The study result showed that the more popular the application of relevant information system of knowledge management, the better the performance of organization's knowledge management. Positive participation of the leaders and creation of knowledge management culture are important factors of the optimal knowledge management performance in the organization. On the other hand, appropriate use of information technology allows the formation of knowledge management culture. This culture could guide or stimulate the organization too. Leader's behavior is the significant factor of creating excellent knowledge management culture. This study attempted to urge the enterprises to check on its organization and operation, and correct their major problems during the preparation of implementing knowledge management, so as to promote the probability of being successful when the enterprises implement knowledge management.

Key words: Drivers of knowledge management, knowledge management performance, knowledge -based economy, operation performance.

INTRODUCTION

More and more researches have shown the importance of knowledge management towards organization. However, a lot of knowledge management documents were conceptual or regarded the aforementioned individual case studies as the foundation to focus on single dimension such as knowledge management, corporate culture, management strategy, and leading behavior to carry out the relevant study of management performance; thus, more thorough studies of the relationship between the drivers of knowledge management and the performance of knowledge management are still short of (Yu et al., 2004; Du, 2005; Tian, 2005). With regard to the studies of knowledge management, different scholars proposed some drivers of knowledge management based on different theories. The following were some of the relevant

*Corresponding author. E-mail: cclee@cc.kyu.edu.tw. Tel: 886-7-6077076.

studies. Studies of Alavi and Leidner (1999), Davenport and Prusak (1998), and Nonaka (1994) discussed knowledge management from the perspectives of organization's internal procedures and they investigated relevant knowledge management activities within the organization, such as knowledge creation, storage, sharing, and usage. This is about the knowledge creation procedure accepted by most organizations currently. Based on resource-based theory, Bharadwaj (2000) and Billinfer and Smith (2001) considered knowledge as the core competitiveness of the organization; the key point of knowledge management is how to use these knowledge assets to establish the strategic decision so as to promote the competitiveness of the organization.

Dong (2006) indicated that significant correlation existed between leadership style, organizational culture, and work environment and operation performance of the enterprises, while the influence of organizational culture was more significant. Study of Jiang (2006) indicated that the knowledge management culture was significantly and positively related to knowledge management performance. When the directors of a company offered sufficient time for the subordinates to share their information, namely the channels of providing information were enough, and knowledge management performance would also be promoted. Study of He (2005) showed that "information technology" provided different levels of adjustments towards the knowledge transformation process of "internal" and "external" knowledge. Hong (2003) pointed out that there was interrelation between leader's behavior and information management, when leader's behavior leaned to the transformational leadership style and the leadership style was positive with adequate empowerment, then application of management tools and establishment of organizational culture would be correlated to leader's behavior; at last, leader's behavior would influence the organizational performance. Besides the studies of the aforementioned scholars, Awad and Ghaziri (2004) considered these major influential factors as the drivers of implementing knowledge management.

The aforementioned studies indicated that knowledge management has a certain influence on the management performances of enterprises. However, when the enterprises need to carry out knowledge management, what factors should be considered and of which is more helpful for the enterprises to carry out the knowledge management? This study wants to find out the influence of knowledge management driver on knowledge management performance thoroughly. According to the investigation carried out from China Credit Information Service, Ltd. in 2007, the top 500 enterprises from the rankings of service industry profit are the subjects of this study. A questionnaire will be carried out in order to understand the relationship between knowledge manage-ment drivers and knowledge management performance of enterprises. The result of this study could serve as a reference for the scholars and enterprise managers when

deciding research directions and management strategies. The following goals were expected to achieve:

Construct a theoretical model of knowledge management drivers from the essential factors of knowledge management drivers

This study found out the conditions and essential factors that influenced the knowledge management performance of organization and constructed the basic theoretical model of knowledge management drivers.

Establish the theoretical model of knowledge management driver

An investigation through questionnaires was carried out to collect data, and then a two-step approach was used to analyze these data, and the theoretical model was tested and verified so as to understand the relationship between knowledge management drivers and knowledge management performance that was implemented in the organization.

Literature review

Knowledge management

Peter (2002) indicated that the society of knowledge would be the next society, so managing knowledge would certainly become the key strategy of enterprises in the future. This will show the importance of knowledge management. However, scholars do not have a unanimous conclusion to the definition of knowledge at present. Different definitions of knowledge bring out different cognitions towards the meaning of knowledge management. In 1994, Nonaka and two other scholars explained that knowledge management is a complicated procedure and activity that creates, identifies, collects, shares, and adjusts the organizational knowledge. In 2003, DongQing Lin defined knowledge management as follows:

> "The purpose of an organization is to promote the survival capability and the competition advantage through obtaining, saving, sharing, transferring, employing, and assessing the valuable knowledge of individuals, groups, or teams that exist inside or outside of the organization."

Knowledge management driver

Knowledge management driver was first proposed by Arthur Andersen and American Productivity and Quality Center (APQC) when they developed knowledge management assessment tool (KMAT) in 1996, which
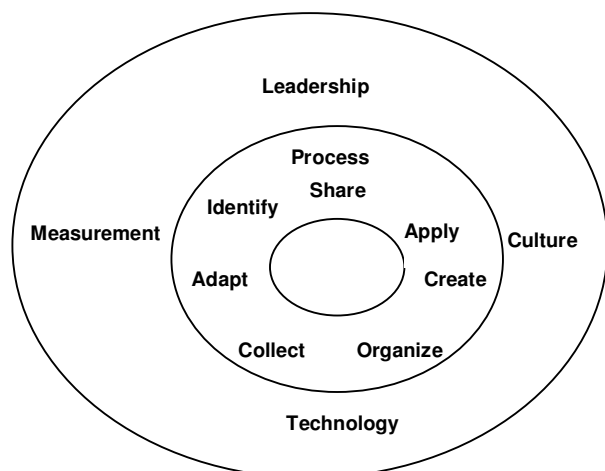
Figure 1. Knowledge management assessment tool (KMAT).

defines driver as the useful essential factor and condition for the organization to carry out knowledge management successfully. It means the organization must pay attention to both successful conditions and useful factors for the organization to carry out knowledge management. Du (2005) defined driver as the important factor that urges the enterprises to carry out knowledge management. Chen (2004) pointed out the essential factors of knowledge management drivers included leadership, corporate culture, information technology, and performance assessment (Figure 1). An open and harmonious working environment, emphasis on interpersonal relationships, and treating the employees with support, trust, encouragement, and open-mindedness allowed the employees to work full of creativity; this is the most favorable environment for the organization to generate knowledge. Lin (2003) believed innovative and harmonious organizational culture is contributive to the generation of knowledge when the organization is carrying out knowledge management.

Wu (2003) pointed out solid foundation of the internal part of the enterprise, possession of innovative learning ability, and creation of highly adaptive culture are the essential factors for the external part of the enterprise to win. Nonaka et al. (1995) also indicated that the essence of knowledge management is to use knowledge to create function and to use knowledge to manage innovative knowledge systematically and in an organized way. Zack (1999) believed knowledge management strategy could guide the business affairs of knowledge management, especially resource allocation of knowledge management, application of knowledge management, and style of knowledge management. As for how to improve the efficiency of implementation of knowledge management, Chait (1999) indicated that the content, culture, procedure, and basic framework must be considered together. From the perspective of how   knowledge   management

influences organization's ability, Gold et al. (2001) believed that the basic development ability of knowledge management included technology, structure, and culture. Holsapple and Joshi (2000) categorized the factors influencing knowledge management of organization into management, resources, and environment.

According to the aforementioned perspectives (Table 1), this study defined driver as a helpful essential factor and condition for the organization to implement knowledge management successfully, namely what conditions an organization should have and what factor it should pay attention to in order to implement knowledge management successfully.

Relevant essential factors of knowledge management

Studies on relevant essential factors of knowledge management are quite unorganized. This study arranged the relevant essential factors of knowledge management that were mentioned by different scholars as follows:

Knowledge management system: Yao (2007) stated that knowledge management system is the process that enterprises create, collect, spread, save, search, and apply knowledge. Its purpose is to accumulate the intellectual capital for the enterprise so as to establish the competitive advantage of the company. She also pointed out knowledge management system is the planning and establishment of a set of knowledge system. It is a mechanism and method that arranges and classifies the information rationally, collects and arranges the information systematically and standardizes all the collected information, and finally saves, applies, and shares the information effectively.

Knowledge management leader: Yu et al. (2004) pointed out that both the support from high-ranking officers and the activities arranged by knowledge management groups would influence the knowledge management performance positively.

Learning within the organization: As for the organizational culture and organizational characteristics of the framework, Yu et al. (2004) also indicated that learning attitude, communication, an intention to share knowledge, and the flexibility of organizational framework would influence knowledge management performance positively.

Reward and encouragement: Yu et al. (2004) indicated that the reward of knowledge management would influence the performance of knowledge management positively. Wu (2005) stated that if the enterprises could timely encourage staff to share knowledge and relate the contribution of sharing knowledge with performance assessment, then better outcome of knowledge sharing would be obtained for sure.

Table 1. Definitions of knowledge management driver.

Scholar	Decade	Definitions of knowledge management driver
Nonaka et al.	1994	The essence of knowledge management is to use knowledge to create function, and to organize the "innovative knowledge" systematically."
Arthur Andersen and APQC	1996	There are four basic factors for the driving force of knowledge management: leadership, culture, assessment, and technology.
Chait	1999	Effective knowledge management system must coordinate four areas: content, culture, procedure, and infrastructure.
Zack	1999	The strategy of knowledge management would lead the operation of knowledge management, especially resource allocation of knowledge management, application of knowledge management, and ways of knowledge management.
Gold et al.	2001	The infrastructure of knowledge management driving force includes technology, framework, and culture.
Lin	2001	There are five enablers in the organization, including the strategy of knowledge management, organizational culture, organizational framework, hardware environment, norm and human resources policy.
Liao	2001	The implementation on knowledge management would be more effective if schools try to create an innovative organization atmosphere.
Lee and Choi	2003	Personnel are the core of creating organization knowledge and the source of creating and sharing knowledge, so how to encourage the personnel willing to create and share knowledge is very important.
Lin	2003	When the organization is carrying out knowledge management, innovative and harmonious organizational culture is contributive to generating knowledge.
Wu	2003	The internal sturdy foundation of the enterprise, innovative learning ability, and highly adaptable culture are the essential factors for the external part of the successful enterprise.
Chen	2004	The essential factors of promoting knowledge management include leadership, corporate culture, information technology, and performance assessment.
Du Plessis	2005	It is the market factor that forces the enterprises to carry out knowledge management.
Ten	2005	The drivers of knowledge management can mainly be categorized into six important weighing factors: organizational culture, organizational framework, personnel, information technology, knowledge strategy, and innovation.

Inefficiency: Du (2005) pointed out gigantic data that makes the enterprises encounter more difficulties when deciding which resources are applicable and utilizing these resources perfectly. Thus, the enterprises must spend time and money on searching, arranging, and analyzing the best resources so as to look for the most efficient method to implement knowledge management activities.

Holding back a trick or two: Du (2005) believed the situation of holding back a trick or two always happens in the enterprises that emphasize "knowledge is power but lack appropriate sharing platform. Enterprises can set up a sharing channel through knowledge management and make use of a reward system to encourage the employees to share the experience and techniques, which will avoid the situation of holding back a trick or two.

Knowledge wastage: Li (2002) indicated that in a fast-changing knowledge environment, innovation is an important skill for the industry. How to avoid a large amount of knowledge loss becomes a crucial issue the

enterprises need to think over thoroughly right now because of employee's resignation.

Network communication and technology: Chen (2003) indicated that if the enterprise has high-speed network connection, it could not only share the knowledge effectively, but also collect, arrange, and analyze the information and knowledge from the network systematically at the same time. Managing enormous information is also one of the essential factors for the enterprises to implement knowledge management.

Trans-organizational and geographical distribution: Yao (2007) believed the use of knowledge management system could break the time barrier and allow the information to be transferred quickly. Knowledge could be used and shared easily and effectively, so the enterprises could respond to the rapid market change and make proper adjustment.

Coordinating cooperation: Mudge (1999) think that the appearance of the network and e-commerce makes the cooperation among enterprises close day by day. From the point of view of customer's management, information management offers the knowledge immediately, and helps enterprises to engage in managing in customer's relation. The staff may renew customer's data anywhere to understand customer's demand, customize the service more efficiently, meet customer's demand, and increase customer's satisfaction. That will have those service-oriented enterprises create a leading status in a market.

Make strategic decision effectively: Petrash (1996) believed that knowledge management means that it provides appropriate knowledge to the appropriate person at the appropriate time so that this person could make the best decision. Du (2005) also indicated that knowledge management could provide useful information, innovative idea, and even non-structured knowledge to support the decision.

Providing competitive advantage to the enterprises: Du (2005) indicated competitive advantage must be maintained by a certain level of knowledge. Successful competitive advantage is based on the management of intellectual assets.

Knowledge management could assure the enterprises to obtain useful and proper knowledge to adjust the strategies at any time. Thus, the enterprises could become more flexible and be a leading competitor in the changing environment.

Knowledge leaking is forbidden: Havens and Knapp (1999) believed that knowledge is the creation by enterprises. This knowledge is considered as the assets of enterprises, and a ban on leaking knowledge has to be considered to knowledge management. Du (2005) pointed out the market value of enterprises depended on

intellectual assets, and then the managers must focus their attention on keeping the intellectual assets, since intellectual assets is as important as such tangible assets as fixed assets and financial assets.

Study framework and hypotheses

This study discusses research from all literature in order to propose three drivers of knowledge management through the knowledge management performance of organizations as the dependent variable of knowledge management driver.

The relationship between the three drivers of knowledge management, and the relationship between the drivers of knowledge management and the knowledge management performance of organizations would be discussed respectively. The study diagram and hypotheses are shown in Figure 2.

Information technology

The information technology examines the popularization of the relevant information system application of knowledge management of organization. This study quotes the ten indicators that were proposed by Chen (2004). His study obtained a factor whose eigenvalue is greater than 1 from the result of factor analysis regarding the questions. Thus, all questions are categorized into a dimension, information system application of knowledge management, and Likert's five-point scale is used to examine the popularization of the organization's information system application of knowledge management. Detailed content shown in Table 2 as follows: This study uses the application of relevant information system of knowledge management as the dimension of the information technology, and then Hypotheses 1 and 4 of this study are proposed as follows (Table 17):

H_1: Information technology is significantly related to the knowledge management performance of the organization.

H_4: Information technology is significantly related to the knowledge management culture of the organization.

Leader's behavior

After reviewing literature, this study uses "multifactor leadership questionnaire", developed by Bass and Avolio (1997), and Scale of Banking Directors' Leading behavior, developed by Yang (2005), as the basis to design this questionnaire. Likert's five-point scale is used to measure the leading behavior of the knowledge management leaders. This dimension includes three factors that are shown in Table 2. Leadership and support of top management and organizational culture factors were perceived to
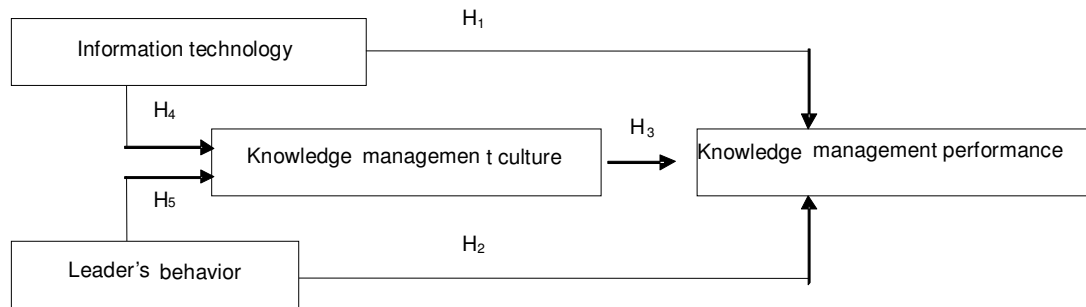
Figure 2. The study diagram.

be the most important factors (Valmohammadi, 2010). This study regards the leading behaviors of directors, knowledge leaders, or chief knowledge officers (CKO) responsible for the implementation of knowledge management in the organization as the dimension of the leader's behavior, including three factors: ideal characters and behaviors, encouragement and sensible inspiration, and particular care. Hypothesis 2 of this study is proposed:

H_2: The leading behavior of knowledge management leader is significantly related to the knowledge management performance of the organization.
Hypothesis 5 of this study is proposed:

H_5: The leading behavior of knowledge management leader is significantly related to the knowledge management culture of the organization.

Knowledge management culture

The cultural factors such as collaboration and trust are basic operation for managing knowledge effectively in a firm. Shaping cultural factors is crucial for a firm's ability to manage its knowledge effectively (Gholipour et al., 2010). The basic assumption was that there was statistically significant difference in perception of KM for two groups of respondents for at least one KM process namely KM culture (Arsenijevi et al., 2010). This study uses both the scale that is developed by Xie as the foundation and also refers to the scale that is developed by Wu (2001), Wu and Wen (2002), and Wu (2004), modifying some words from the questions. There are four dimensions of knowledge management culture including (1) knowledge creating, (2) knowledge learning, (3) knowledge sharing, and (4) knowledge cooperating, and 16 questions are included. Likert's five-point scale is used to weigh the condition of knowledge management culture of the organization. Hypothesis 3 of this study is proposed:

H_3: The knowledge management culture is significantly related to the knowledge management performance of the organization.

Knowledge management performance of organization

The purpose of knowledge management performance is to measure the organizational performance that is promoted directly by the implementation of knowledge management. This study refers to the study of Chen (2004) and the 14 indicators that are proposed by Gold et al. (2001), and Likert's five-point scale is used to measure the knowledge management performance of the organization. The detailed content is shown in Table 6, including two factors:

1. Market-oriented: It refers to how the organization deals with the situations in a competitive market. In other words, it focuses on how the organization masters the situations of the external environment.
2. Improvement of the procedure: It is related to the managerial knowledge of improvement of internal procedure, or how the organization deals with the situations of the internal environment through the implementation of knowledge management.

Lastly, the definitions of the aforementioned dimension and the key points of the operational questionnaire are arranged in Table 3 as follows:

THE STUDY DESIGN

According to the two-step approach of Anderson and Gerbing (1988), SPSS statistical software was first used to carry out data reliability and validity analyses and exploratory factor analysis, and then verification of measuring model was carried out using LISREL8.51 statistical software.

Sample collection

According to the investigation carried out from China Credit Information Service, Ltd. in 2007, the top 500 enterprises from the profit rankings of service industry were the subjects of this study. Through questionnaires online, the mutual relationship between the three individual drivers of knowledge management would be discussed, and then the relationship between the drivers of know-ledge management and the knowledge management performance in the organization would be discussed. This study invited the enterprises to fill in the questionnaire through e-mail, and then

Table 2 . Meanings of "scale of knowledge management leaders' leading behavior".

Ideal attributes and behaviors	It means that the knowledge leader gets the trust, respect, and acceptance from the employees. He/she gains the trust from the subordinates through personal conduct and behavior and the creation of knowledge management vision; hereby, he/she is also very confident and able to emphasize the importance of implementing knowledge management.
Inspirational motivation and intellectual stimulation	It means that the knowledge leader can encourage and support the employees to use innovative concepts and method to solve the problems, and he/she can promote the employees' realization towards knowledge management through encouragement, inspiration, and with the employees' common consensus.
Individualized consideration	It means that the knowledge leader can provide the employees with the learning and growing opportunities, and he/she will focus on the employees' particular need to care for and guide them.

Source: Bass and Avolio (1997), Yang (2005).

Table 3. The weighing key points of the study dimensions and operational definitions.

Dimension	Weighing key point
Leader's behavior	Weigh the leading behavior of the knowledge management leader.
Knowledge management culture	Weigh the four situations of knowledge management culture: knowledge creating, knowledge learning, knowledge sharing, and knowledge cooperating.
Application of knowledge management system	Weigh the popularization of all knowledge management information systems in the organization.
Knowledge management performance	Weigh the organizational performance from the implementation of knowledge management.

then phone calls were made to understand the company's current situation of implementing knowledge management and the companies that were unsuitable to fill in the questionnaire were excluded. At last, phone calls were made to ensure the completeness of answered questionnaire. Copies of questionnaires were sent, and 142 valid copies were completed after two-month phone communication and coordination. The returning rate of questionnaire was 28.4%.

SPSS15.0 statistical software was used to analyze the questionnaire results of every driver respectively, and factor analysis was used to carry out validity test. For reliability, Cronbach's α value was used to measure the consistence among every item of the same dimension. For validity, principal factor analysis was used to test the validity of every question, namely the contribution level of every question towards this dimension. Factor analysis was carried out for every dimension, and the factor with Eigen value that was greater than 1.0 was extracted. The factor loading of every question was larger than 0.7 and cumulative explained variance was greater than 70%. The validity test showed that all Cronbach's α value were greater than 0.92, and the "item to total" value of every question was greater than 0.7, indicating that internal consistence existed in every dimension, and the detailed analytical result is shown in Table 4.

Confirmatory factor analysis

This study made use of the analytical software, LISREL8.51, and structural equation modeling (SEM) to carry out confirmatory factor analysis. SEM is a kind of statistical method used for analyzing cause and effect to do confirmatory factor analysis or covariance structure analysis. It is a method that combines factor analysis and path analysis, in which the limitations of both methods could be reduced and the purposes of both methods could be achieved at the same time. Compared with the traditional path analysis, SEM not only considers the measurement of errors, but also provides fit indicators and modification indicators of the model. These strengths are very helpful to the construction of a theoretical model (Chen, 2001). Therefore, this study selected and used SEM to verify the overall fit of the four driver factors towards the corresponding driver and the overall fit of the study model, and then reliability assessment would also be carried out by SEM.

From the analytical result of this model fit for leader's behavior, one could know that $x^2_{(95)}$ value was 178.293 and x^2/df was 1.877. Although p-value was 0.000, other indicators were conformed to the conditions of optimal value, and GFI value was 0.861 that was also very close to the optimal value. Therefore, according to the analytical result, one could know that the model fit for leader's behavior was acceptable (Table 5). From the analytical result of model fit for knowledge management culture, one could know that $x^2_{(98)}$ value was 21.029, p-value was 1.000, and x^2/df value was 0.215, and other indicators were conformed to the conditions of optimal value as well. Therefore, the analytical result showed that the model fit for knowledge management culture was acceptable (Table 6). From the analytical result of model fit for knowledge management performance, one could know that $x^2_{(95)}$ value was 139.768 and x^2/df was 2.055. Although p-value was 0.000, other indicators were conformed to the conditions of optimal value,

Table 4. Question design for knowledge management leaders' leading behavior and references (Major references: Bass and Avolio (1997), and Yang (2005).

Factors	Elementary load factor	Item to total	Eigen value	Cronbach's α
Information technology	0.762~0.901	0.706~0.873	7.181	0.956
Cumulative variance (%): 71.809				
Ideal characters and behaviors	0.868~0.926	0.806~0.888	4.814	0.950
Encouragement and sensible inspiration	0.898~0.956	0.880~0.934	5.167	0.967
Particular care	0.925~0.956	0.873~0.919	3.529	0.955
Cumulative variance (%): 79.775				
Knowledge creating	0.907~0.961	0.841~0.926	3.566	0.958
Knowledge learning	0.906~0.950	0.835~0.905	3.419	0.943
Knowledge sharing	0.847~0.938	0.742~0.884	3.297	0.928
Knowledge cooperating	0.884~0.941	0.798~0.890	3.357	0.936
Cumulative variance (%): 76.102				
Market-oriented	0.888~0.922	0.845~0.891	5.724	0.962
Improvement of the procedures	0.907~0.951	0.874~0.931	6.051	0.974
Cumulative variance (%): 81.850				

Table 5. The model fit for leader's behavior.

	Model fit indicators	Optimal value	Analyzed value
Absolute fit	x^2	p>0.05	p = 0.000
	x^2/df	<3.00	1.877
	GFI	>0.90	0.861
	RMR	<0.08	0.0252
Incremental fit	NFI	>0.90	0.945
	NNFI	>0.90	0.966
	CFI	>0.90	0.973
	IFI	>0.90	0.974
Parsimonious fit	PNFI	>0.50	0.748
	PGFI	>0.50	0.602

Table 6. The model fit of knowledge management culture.

	Model fit indicators	Optimal value	Analyzed value
Absolute fit	x^2	p>0.05	p = 1.000
	x^2/df	<3.00	0.215
	GFI	>0.90	0.981
	RMR	<0.08	0.0421
Incremental fit	NFI	>0.90	0.976
	NNFI	>0.90	1.000
	CFI	>0.90	1.000
	IFI	>0.90	1.000
Parsimonious fit	PNFI	>0.50	0.797
	PGFI	>0.50	0.707

Table 7. The model fit for knowledge management performance.

	Model fit indicators	Optimal value	Analyzed value
Absolute fit	x^2	p>0.05	p = 0.000
	x^2/df	<3.00	2.055
	GFI	>0.90	0.881
	RMR	<0.08	0.0246
Incremental fit	NFI	>0.90	0.952
	NNFI	>0.90	0.966
	CFI	>0.90	0.975
	IFI	>0.90	0.975
Parsimonious fit	PNFI	>0.50	0.711
	PGFI	>0.50	0.571

Table 8 . The fit of study model.

	Model fit indicators	Optimal value	Analyzed value
Absolute fit	x^2	p>0.05	p = 0.000
	x^2/df	<3.00	2.560
	GFI	>0.90	0.876
	RMR	<0.08	0.030
Incremental fit	NFI	>0.90	0.942
	NNFI	>0.90	0.953
	CFI	>0.90	0.965
	IFI	>0.90	0.965
Parsimonious fit	PNFI	>0.50	0.728
	PGFI	>0.50	0.587

and GFI value was 0.881 that was also very close to the optimal value.

According to the analytical result, one could know that the model fit for knowledge management performance was acceptable (Table 7). From the analytical result of overall study model fit, one could know that $x^2_{(95)}$ value was 135.047 and x^2/df was 2.560. Although p-value was 0.000, other indicators were conformed to the conditions of optimal value, and GFI value was 0.876 that was also very close to the optimal value. The analytical result showed that the overall study model fit was acceptable (Table 8). From the analytical result of leader's behavior that was shown in Table 12, one could know that all standardized factor loadings were greater than 0.5 and T-values were greater than 3.29 that have reached the significance level of α = 0.001, showing that the scale of leader's behavior had good construct validity and the model had good interpreting ability. The composite reliabilities of every question were between 0.981 and 0.987, which were above 0.7, indicating that the scale of leader's behavior had high reliability and the internal consistency was satisfactory as well.

From the analytical result of leader's behavior as shown in Table 9, one could know that the average variance extracted of every factor was above 0.5, indicating that the scale of leader's behavior was

able to interpret more than 50% of variance. Composite reliability and average variance extracted were conformed to the optimal result, showing that the scale of leader's behavior had good reliability (Table 10). The analytical result of knowledge management culture showed that all standardized factor loadings were greater than 0.5 and T-values were greater than 3.29 that have reached the significance level of α = 0.001, indicating that the scale of knowledge management culture had good construct validity and the model had good interpreting ability. The composite reliabilities of every question were between 0.967 and 0.970, which were above 0.7, indicating that the scale of knowledge management culture had good reliability and the internal consistency was good as well (Table 11).

The analytical result of knowledge management culture showed that the average variance extracted of every factor was above 0.5, indicating that the scale of knowledge management culture was able to interpret more than 50% of variance (Table 12). Composite reliability and average variance extracted were conformed to the optimal result, showing that the scale of knowledge management culture had good reliability. The analytical result of knowledge management performance showed that all standardized factor loadings were greater than 0.5 and T-values were greater than 3.29 that have reached the significance level of α = 0.001, indicating that

Table 9. Confirmatory factor analysis of leader's behavior.

Factor	Question number	Standardized factor loading	T-value	Composite reliability
Ideal characters and behaviors	11	0.81	11.569	
	12	0.88	13.359	
	13	0.94	14.788	0.986
	14	0.86	12.867	
	15	0.84	12.297	
	16	0.83	11.977	
Encouragement and sensible inspiration	17	0.91	13.976	
	18	0.87	12.932	
	19	0.92	14.262	0.987
	20	0.92	14.287	
	21	0.92	14.348	
	22	0.89	13.536	
Particular care	23	0.90	13.858	
	24	0.93	14.620	0.981
	25	0.90	13.679	
	26	0.91	14.134	

*** $p < 0.001$.

Table 10. Average variance extracted of the measuring factors of leader's behavior.

	Ideal characters and behaviors	Encouragement and sensible inspiration	Particular care
Ideal characters and behaviors	0.919	0.920	0.890
Encouragement and sensible inspiration	0.920	0.927	0.934
Particular care	0.890	0.934	0.929

the scale of knowledge management performance had good construct validity and the model had good interpreting ability. The composite reliabilities of every question were between 0.975 and 0.988, which were above 0.7, indicating that the scale of knowledge management performance had good reliability and the internal consistency was good as well (Table 13). The analytical result of knowledge management performance showed that the average variance extracted of every factor was above 0.5, indicating that the scale of knowledge management performance was able to interpret more than 50% of variance (Table 14).

Composite reliability and average variance extracted were conformed to the optimal result, showing that the scale of knowledge management performance had good reliability. The analytical result of study model showed that all standardized factor loadings were greater than 0.5 and T-values were greater than 3.29 that have reached the significance level of $\alpha = 0.001$, indicating that the study model had good construct validity and good interpreting ability (Table 15). The composite reliabilities of every factor were between 0.975 and 0.988, which were above 0.7, indicating that the study model had good reliability and the internal consistency was good as well (Table 16). The analytical result of study model showed that the average variance extracted of every dimension was above 0.5, indicating that the study model was able to interpret more than 50% of variance. Composite reliability and average variance extracted were conformed to the optimal result,

showing that the study model had good reliability (Table 17). Figure 3 is the SEM path of the study model. Relationships of every dimension's factors, level of influence, and the hypotheses that verified this study could be known from the standardized path coefficients and t-values shown in Figure 4. Path coefficient, t-value, and p-value of information technology towards knowledge management performance of organization were 0.700, 11.612, and 0.000 respectively. Path coefficient, t-value, and p-value of leader's behavior towards knowledge management performance of organization were 0.868, 20.692, and 0.000 respectively. Path coefficient, t-value, and p-value of knowledge management culture towards knowledge management performance of organization were 0.928, 29.369, and 0.000 respectively. Path coefficient, t-value, and p-value of information technology towards knowledge management culture were 0.705, 11.761, and 0.000 respectively. Path coefficient, t-value, and p-value of leader's behavior towards knowledge management culture were 0.885, 22.485, and 0.000 respectively.

RESULTS

The relationship between information technology and knowledge management performance of organization

The result showed that information technology was

Table 11. Confirmatory factor analysis of knowledge management culture.

Factor	Question number	Standardized factor loading	T-value	Composite reliability
Knowledge creating	27	0.69	8.771	
	28	0.70	9.024	0.970
	29	0.71	9.227	
	30	0.64	8.062	
Knowledge learning	31	0.67	8.415	
	32	0.71	8.977	0.968
	33	0.64	7.909	
	34	0.65	7.963	
Knowledge sharing	35	0.61	7.637	
	36	0.69	8.869	0.967
	37	0.65	8.223	
	38	0.64	8.096	
Knowledge operating	39	0.67	8.608	
	40	0.66	8.386	0.968
	41	0.68	8.729	
	42	0.61	7.532	

*** p<0.001.

Table 12. Average variance extracted of the measuring factors of knowledge management culture.

	Knowledge creating	Knowledge learning	Knowledge sharing	Knowledge cooperating
Knowledge creating	0.890	0.829	0.883	0.864
Knowledge learning	0.829	0.883	0.840	0.799
Knowledge sharing	0.883	0.840	0.881	0.925
Knowledge cooperating	0.864	0.799	0.925	0.883

Table 13 . Confirmatory factor analysis of knowledge management performance.

Factor	Question number	Standardized factor loading	T-value	Composite reliability
Market-oriented	43	0.82	11.838	
	44	0.83	12.058	
	45	0.89	13.635	
	46	0.85	12.618	0.988
	47	0.90	13.687	
	48	0.88	13.215	
	49	0.91	14.024	
Improvement of the procedures	50	0.92	14.410	
	51	0.92	14.301	
	52	0.89	13.506	
	53	0.85	12.645	0.975
	54	0.88	13.241	
	55	0.94	14.886	
	56	0.94	14.890	

*** p<0.001.

Table 14. Average variance extracted of the measuring factors of knowledge management performance.

	Market-oriented	Improvement of the procedures
Market-oriented	0.921	0.947
Improvement of the procedures	0.947	0.846

Table 15. Confirmatory factor analysis of study model.

Dimension	Factor	Standardized factor loading	T-value	Composite reliability
Information technology	The application of knowledge management information system	0.862	12.880	0.931
	Ideal characters and behaviors	0.860	12.810	
Leader's behavior	Encouragement and sensible inspiration	0.905	13.890	0.974
	Particular care	0.910	14.073	
Knowledge management culture	Knowledge creating	0.685	8.771	0.968
	Knowledge learning	0.668	8.316	
	Knowledge sharing	0.648	8.206	
	Knowledge cooperating	0.655	8.314	
Knowledge management performance	Market-oriented	0.869	13.011	0.937
	Improvement of the procedures	0.906	13.983	

Table 16. Average variance extracted of the study model.

Dimension	Leader's behavior	Knowledge management culture	Application of knowledge management system	Knowledge management performance
Leader's behavior	0.932	0.740	0.705	0.701
Knowledge management culture	0.740	0.925	0.888	0.871
Application of knowledge management system	0.705	0.888	0.884	0.927
Knowledge management performance	0.701	0.871	0.927	0.881

Table 17. Summary of the results of study hypotheses.

| Hypothesis	Valid or invalid
H_1: Information technology is significantly correlated with the knowledge management performance in the organization.	Valid
H_2: The leading behavior of knowledge management leader is significantly correlated with the knowledge management performance in the organization.	Valid
H_3: The knowledge management culture is significantly correlated with the knowledge management performance in the organization.	Valid
H_4: Information technology is significantly correlated with the knowledge management culture in the organization.	Valid
H_5: The leading behavior of knowledge management leader is significantly correlated with the knowledge management culture in the organization.	Valid
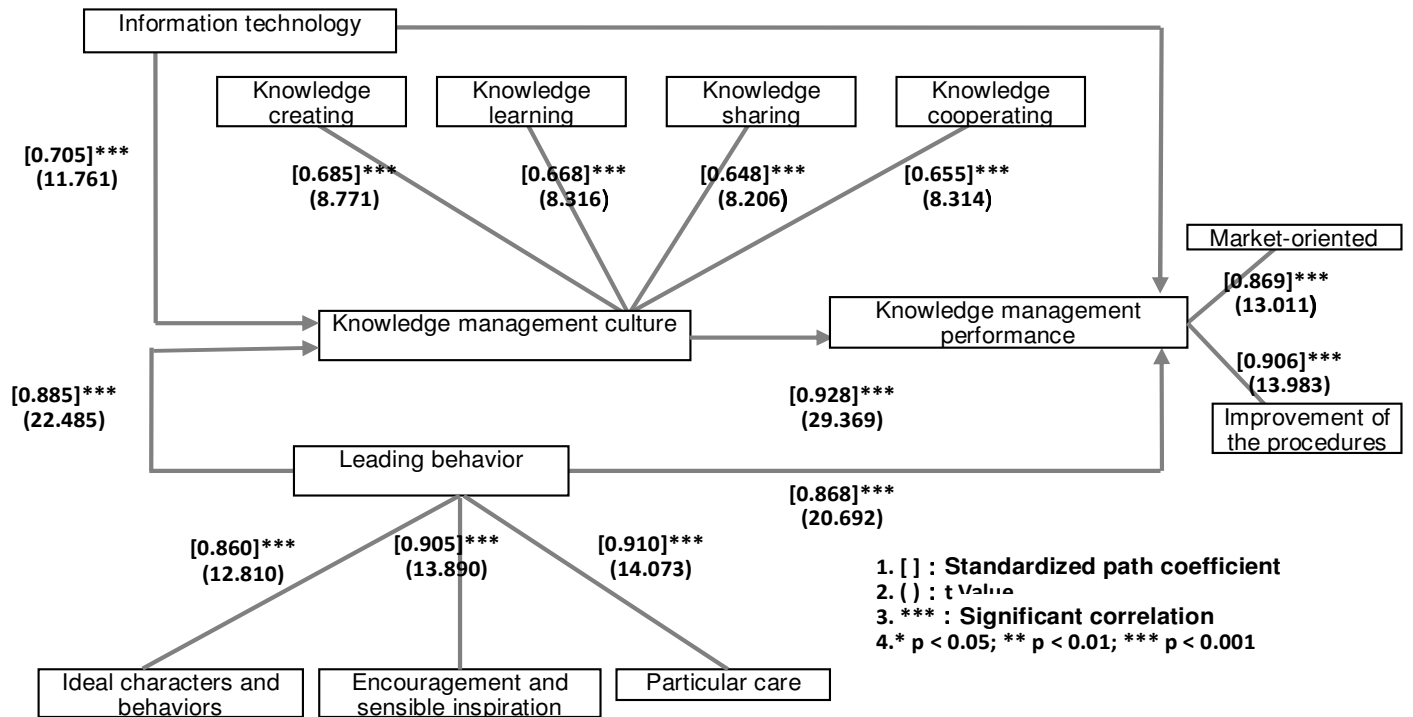
Figure 3. Hypothesis testing results.
Note: Path significance.

significantly and positively correlated with the knowledge management performance, which means that the more popular the application of relevant information system of knowledge management is, the better performance of organization implementing the knowledge management. This result was consistent with the results of the previous research.

The relationship between leader's behavior and knowledge management performance of organization

The result showed that the leader's behavior had a significantly positive influence on the knowledge manage-ment performance of the organization. The leader's behavior included three dimensions: ideal characters and behaviors, encouragement and sensible inspiration, and particular care. When the organization implemented knowledge management, the knowledge leader responsible for implementing knowledge management could get the trust, respect, and acceptance from the employees, and hence, he/she was very confident and able to emphasize the importance of implementing knowledge management. The knowledge leader needed to encourage and support the employees using innovative concepts and methods to solve the problems, and then could promote the employees' realization towards knowledge management through encouragement and inspiration with the employees' common consensus.

Moreover, if the knowledge leader could focus on the employees' particular needs to care for, and provide them with the learning and growing opportunities, it would be helpful to promote the knowledge management perfor-mance in the organization, and this result was consistent with the previous studies.

The relationship between knowledge management culture and knowledge management performance of organization

The result showed that knowledge management culture was significantly and positively correlated with the knowledge management performance of organization. There were four dimensions in knowledge management culture: knowledge creating, knowledge learning, knowledge sharing, and knowledge cooperating, showing that if the organization could provide a favorable environment that supports personal creativity and allows every member in the organization to share their knowledge with others willingly, then the members from the organization would be influenced imperceptibly to create, learn, and spread knowledge spontaneously. They are also willing to accept others' opinions, and cooperate with others. Thus, the relevant activities that can be contributive to knowledge management of the organization could be implemented as well, and this result was consistent with the results of the previous research.

The relationship between information technology and knowledge management culture

The result indicated that information technology was significantly and positively correlated with the culture of knowledge management, which showed that information technology would lead or stimulate the formation of knowledge management culture. If information technology is used to establish knowledge management platform to manage and share knowledge effectively, and simultaneously the organization can carry out the implementation policy to reward the members who shares their knowledge experiences so as to create good knowledge management culture, it will be helpful for the enterprise to implement the knowledge management successfully. Through the use of relevant information systems of knowledge management, the members of the organization could be able to document the implicit knowledge and turn it into explicit knowledge easier, which would be contributive to the implementation of knowledge creating, learning, sharing, and cooperating. This also indicated that when the accumulation and management of the organization's knowledge through information technology, the optimal efficiency for the organization management could be achieved through the sharing of organizational culture.

The relationship between leader's behavior and knowledge management culture

From the analytical result, the leader's behavior had a significant and positive influence on the knowledge management culture of organization. It means the leading behavior of knowledge management is a vital factor of creating high quality knowledge management culture. The knowledge leader has their own charisma and foresight, and they could create good knowledge management culture and atmosphere through encouragement and inspiration; thus, the members in the organization could implement the achievements of knowledge creating, sharing, learning, and cooperating spontaneously.

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