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Methodology for the Development of Knowledge Management on Organizational Performance Based on Employees' Professional Competence

Yuejun HUANG¹, Aimin YAN², Richard SMITH³

Abstract

The 21st century is the age for knowledge workers, when knowledge management is the major business issue. It becomes the major issue for an enterprise maximizing the knowledge value with effective knowledge management. A hi-tech industry has to learn various types of regulations and understand administrative procedure of relevant regulations to present the knowledge. For this reason, a hi-tech industry requires highly professional knowledge and skills as well as strict and careful professional attitudes. The professional competence of employees in hi-tech industries is the combination of knowledge, skills, and experience and requires long-term accumulation through organizational learning that it is the most precious resource of a hi-tech industry to create work value and provide quality service. In this case, a hi-tech industry, with professional knowledge as the capital, applying knowledge management to effectively manage knowledge reveals significant meanings. By discussing domestic and international literatures, theories of knowledge management are studied in-depth to conclude the effect of knowledge management on professional competence and organizational performance. Employees of hi-tech industries in Shanghai are preceded the questionnaire survey in this study, and the retrieved questionnaire data are proceeded statistical analyses for the conclusion and suggestions.

Keywords: knowledge management, professional competence, organizational performance, hi-tech industry.

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Introduction

Along with the approach of knowledge-based economic era, knowledge is the largest wealth of humans. The 21st century is an era for knowledge workers, when knowledge management is the most important business issue. It therefore becomes a primary issue for creating the maximum value of knowledge inside and outside an organization with effective knowledge management. Services offered by a hi-tech industry are diversified; the special work character, complicated items, and closeness with people's life, property safety, and personal rights present the heavy responsibility. The promotion of knowledge management aims to establish the mechanism for organizational employees participating in knowledge sharing and enhancing the ability of innovation and collective creation to further integrate knowledge dispersed in various areas, including the acquisition, innovation, storage, and transfer of knowledge to create larger added value and effectiveness. Knowledge management could enhance the quality and quantity of an organization creating knowledge and reinforce the availability and value of knowledge. In the emergence of economic era, knowledge assets replace past tangible resources to become the key competitive tactic of an enterprise. Knowledge management would be the key in the innovation and inheritance of organizational culture and the development of high performance of an organization. For this reason, a hi-tech industry, with professional knowledge as the capital, effectively managing knowledge with knowledge management presents significant meaning.

A hi-tech industry therefore requires highly professional knowledge and skills as well as strict and careful professional attitudes. The professional competence of employees in a hi-tech industry is the effective combination of knowledge, skills, and experiences as well as the integration of implicit knowledge and explicit knowledge, and requires the long-term accumulation of organizational learning. They are the most precious resources of a hi-tech industry to create work value and provide quality service. For this reason, the effect of knowledge management on professional competence and organizational performance of employees in hi-tech industries is studied.

Literature review

Knowledge management

Chan & Yeung (2016) pointed out knowledge management as a meaningful strategy, a complicated process, and requiring powerful factors as the support, including strategy and leadership, culture, technology, and measurement. Bermudez-Gonzalez, Sasaki, & Tous-Zamora (2016) regarded knowledge management as a series of activities assisting an organization in acquiring its and others' knowledge to achieve the organizational tasks through careful

judgment and to promote the organizational performance through knowledge creation, acquisition, and use (Masa'deh *et al.*, 2017). Askarian & Abdollahi (2016) referred knowledge management as “timely giving correct knowledge to members in needs to help the members adopt correct actions to enhance the continuity of organizational performance”. Such a process contained knowledge creation, confirmation, collection, classification & storage, share & access, use & improvement, and elimination.

Referring to Wang, Wang, & McLeod (2018), four major dimensions for knowledge management is proposed in this study: (1) *Organizational culture*: Knowledge sharing experience and the success of knowledge management in an organization are mainly related to organizational culture. Successful knowledge management therefore relies on the match with culture, management, and organization; (2) *Organization structure*: Organization structure in an organization could induce or hinder knowledge management. Complicated knowledge is required for complicated organization structure, while pure or concentrated organization structure requires simply knowledge (Ghosh, 2016); (3) *Support & application*: The support & application of information technology could extract and store knowledge hid in individuals and groups for the utilization of other members in the organization. Besides, technology could help knowledge organization and even induce new knowledge (Zaied, Louati, & Affes, 2015); (4) *Knowledge strategy*: Knowledge is a valuable intelligence, which could be presented with information, experience, abstract concepts, standard operating procedures, systematic document, and specific techniques. Although there might be various types of knowledge presentation, the essence is to present the effect of creating added value.

Professional competence

Tsai & Wu (2015) regarded professional competence as knowledge, skills, attitudes, and personal value required for executing tasks. Alrubaiee *et al.* (2015) considered that professional competence contained professional knowledge, professional skills, and professional attitudes and mentioned that the standard of professional competence was based on the specialty recognized in certain period, and professional knowledge, skills, and attitudes would mutually function and occur simultaneously. It revealed the time meaning of professional competence. In other words, knowledge skills or standards required for specialty would change with the time (Ghosh, 2016). With broad points of view, Rasmussen & Hall (2016) argued that professional competence involved in all professional fields and the central issue of the served customers; professional competence did not simply cover personal specific performance on cognition, affection, and skills, but would involve in personal needs for work role or position.

Referring to Cheng *et al.* (2016), three factors are included in professional competence: (1) Knowledge refers to the fact and data understood by professional personnel, who could efficiently enhance the achievement of a function through the

acquired information. Knowledge is mostly emphasized in traditional professional trainings, as knowledge is the essential condition for actual performance; besides, it is easier to evaluate knowledge; (2) Skills refer to the ability of a professional personnel applying knowledge to solve particular problems. The evaluation could be completed from observing the actual performance or specific performance; (3) Attitudes refer to the approach-avoidance function of affection to evaluate specific person's attitudes by observing the dialogue or behavioral performance. Nevertheless, the evaluation of attitudes is hard to be objective, but cannot be ignored.

Organizational performance

Organizational performance could be the output-input ratio and the attainment of goals in the overall business of an enterprise as well as each participant's satisfaction with the business process (Alshurideh, Alhadeed, & Barween, 2015). Generally speaking, a lot of business managers and experts regarded financial performance indicators of operating revenue, profit rate, and production effectiveness as the performance evaluation indicators (Santoro, Vrontis, & Dezi, 2017). Bailey, Albassami, & Al-Meshal (2016) indicated that business performance was the outcome of business activities, which contained the creation of operating revenue, control of costs, and presentation of profits. Organizational performance presented complexity that it should be interpreted with multiple dimensions. Organizational performance therefore should have different definitions, measurement methods, and indicators to conform to current applications (Hume & Hume, 2015).

Referring to Hu & Jiang (2018), three dimensions are proposed for organizational performance in this study: (1) *Job satisfaction*: Job satisfaction is an employee's psychologically and physiologically subjective satisfaction with working environment and the job. Job satisfaction is considered as an employee's preference for the job. A worker would appear job satisfaction when the job characteristics are suitable for the wish; (2) *Organizational goal*: A goal refers to the standard being achieved in a task or a plan as well as a correct, specific, and rational central standard pushed by intrinsic motive; (3) *Work performance*: Work performance refers to the "quality and quantity" performed on the achievement of individual or group tasks. It refers to an individual behavior, as an organizational member, performed to complete the formal role expected and regulated by the organization.

Research hypothesis

Chan & Yeung (2016) pointed out the significant correlation between knowledge management and core competence; meanwhile, knowledge management appeared remarkable effects on core competence. Bolman & Deal (2017) emphasized that it was necessary to grasp knowledge before grasping competitive advantages. In the

fiercely competitive era, competition was gradually transferred from labor-intensive to knowledge-intensive. Good knowledge management could promote employees' professional competence, enhance the knowledge asset of an enterprise, and allow the employees' personal knowledge being well applied by the enterprise. Askarian & Abdollahi (2016) indicated that knowledge management could create the value of intelligent assets of an enterprise as well as enhance employees' professional competence and the competitive advantage of the enterprise. Core competence was extracted from professional competence, with value, that core competence could be a kind of professional competence. Wang, Wang, & McLeod. (2018) mentioned that knowledge management aimed to accelerate the core competence for the survival of an enterprise to induce the corporate members' potential knowledge creation ability and further enhance employees' professional competence to eventually promote employees' core competence. As a result, the following hypothesis is proposed in this study.

H1: Knowledge management shows significant correlations with professional competence.

Tsai & Wu (2015) proposed the notably positive correlation between sales ability and sales performance as well as the positive effect of sales ability on sales performance. Cakar & Kim (2015) divided auditors' professional competence into general professional competence and auditing professional competence. The empirical analysis revealed significant effects of professional competence on organizational performance. Rasmussen & Hall (2016) pointed out the remarkably positive correlation between professional competence and organizational performance of teachers. Cheng *et al.* (2016) proposed notably positive correlations between professional competence and organizational performance. Alrubaiee *et al.* (2015) discovered that auditors' core competence presented positive correlations with organizational performance. Bailey, Albassami, & Al-Meshal (2016) found out the significant effect of professional competence on organizational performance of emergency nursing staff. Alshurideh, Alhadeed, & Barween (2015) also pointed out the notable correlation between professional competence and organizational performance. Accordingly, the following hypothesis is proposed in this study.

H2: Professional competence presents remarkable correlations with organizational performance.

To promote knowledge management, an enterprise has to first establish the consensus inside the organization, carefully select and properly apply information technology systems suitable for the organization, create happy learning culture, and provide learning environment for the promotion of knowledge management. Furthermore, a leader should have definite goal of knowledge management and support it continuously in order to establish the learning culture of the organization

and apply knowledge to enhance organizational performance (Santoro, Vrontis, & Dezi, 2017). Chavez *et al.* (2017) indicated that knowledge management capability lied in knowledge creation, requiring flexibility but not working principles; strict formal regulations in an organization would generate adverse ideas. Hume & Hume (2015) argued that knowledge creation was more easily generated under the communication and interaction without obstacles; being too much formalized would stop knowledge creation; and, knowledge creation would result in the largest competitive advantage for an organization. Hu & Jiang (2018) referred knowledge strategy as organizational members, through the understanding of the organizational knowledge strategy, integrated personal goal with organizational goal to acquire the optimal personal performance and achieve the organizational goal. For this reason, the following hypothesis is proposed in this study.

H3: Knowledge management reveals notable correlations with organizational performance.

Research method

Method model

Test for goodness-of-fit in LISREL model is generally the measurement of overall model fit (extrinsic quality of model) and intrinsic quality of model. In regard to the test of overall model fit, the following indicators are commonly used. (1) “ χ^2 ratio” (chi-square ratio) stands for the gap between actual theoretical model and expected value, which is better smaller than 3. (2) Goodness of fit index (GFI) and adjusted goodness of fit index (AGFI) present the better fit when being closer to 1. (3) Root mean square residual (RMR), reflecting the square root of “variance of fit residual/covariance mean”, is better smaller than 0.05. (4) Incremental fit index (IFI) reveals good model fit when larger than 0.9

Evaluation indicators for the intrinsic quality of model is often applied in LISREL, including (1) square multiple correlation (SMC) of individual manifest variables, as R^2 of manifest variables and latent variables, which should be larger than 0.5, (2) component reliability (ρ) of latent variables, as the Cronbach’s α of observed indicators of the latent variables, which should be larger than 0.6, and (3) average variance extracted of latent variable, calculated by R^2 sum of various manifest variables of a latent variable divided by the number of manifest variables to show the percentage of manifest variables being able to measure the latent variable, which is better larger than 0.5.

Research sample and object

Employees of hi-tech industries in Shanghai are randomly distributed 450 copies of questionnaire, and 327 valid copies are retrieved, with the retrieval rate 73%. The retrieved questionnaire data are analyzed with statistics software.

Test of reliability and validity

Validity refers to a measuring scale being able to actually measure the degree of what a researcher intends to measure. The common validity contain “content validity”, tending to qualitative confirmation, “criterion of validity”, measured with external criterion and the correlation coefficient in the test, and “construct validity”, used for evaluating the theoretical consistence of a measurement to other observable variables. To ensure the content validity, the questionnaire content of this study is based on past theories and referred to the actual conditions of research objects to really express the object essence and the complete representativeness. The final common estimate of the factor analysis result is applied to test the construct validity of various items. The acquired validity appears in 0.8~0.9, showing the favorable validity of the questionnaire.

Analysis of empirical result

Model fit test

“Maximum likelihood” is utilized as the estimation in this study, and the analysis results achieve convergence. Overall speaking, *Table 1*, the indicators for the overall model fit in this study pass the test and thoroughly reflect good extrinsic quality of the model.

Table 1: Model analysis result

	evaluation indicator	judgment standard	result
overall model fit	p -value	p -value > 0.05	0.000
	$\chi^2/d.f.$	< 3	1.562
	GFI	> 0.9	0.977
	AGFI	> 0.9	0.904
	CFI	> 0.9	0.963
	RMR	<0.05, lower than 0.025 excellent	0.012
	RMSEA	0.05~0.08 good <0.05 excellent	0.031
	NFI	> 0.9	0.932
	IFI	> 0.9	0.925

Test of path relationship

Regarding the test of the intrinsic quality of model, the square multiple correlation (SMC) of manifest variables is higher than 0.5 (*Table 2 & Table 3*), revealing good measuring indicators of latent variables. Furthermore, latent variables of knowledge management, professional competence, and organizational performance show the component reliability higher than 0.6 and the average variance extracted of dimensions is higher than 0.5 (*Table 4*), apparently conforming to the requirement for intrinsic quality of model.

Table 2: SMC of variable to dimension

knowledge management			
organizational culture	organization structure	support & application	knowledge strategy
0.71	0.75	0.78	0.84

Table 3: SMC of variable to dimension

professional competence			organizational performance		
knowledge	skills	attitudes	job satisfaction	organizational goal	work performance
0.73	0.76	0.82	0.78	0.80	0.87

Table 4: Component reliability and average variance extracted of variable

item	knowledge management	professional competence	organizational performance
component reliability	0.851	0.837	0.886
average variance extracted	0.84	0.81	0.87

From *Table 5*, knowledge management presents positive and notable correlations with professional competence (0.846), professional competence reveals positive and significant correlations with organizational performance (0.871), and knowledge management appear notable correlations with organizational performance (0.863), revealing that H1, H2, and H3 are supported. The test of research hypotheses are shown in *Table 6*.

Table 5: Linear structural relations model analysis result

evaluation item	parameter/evaluation standard	result	t
internal fit	knowledge management→professional competence	0.873	31.52**
	professional competence→organizational performance	0.859	27.46**
	knowledge management→organizational performance	0.842	22.73**

Table 6: Hypothesis test

research hypothesis	correlation	empirical result	P	result
H1	+	0.873	0.00	supported
H2	+	0.859	0.00	supported
H3	+	0.842	0.00	supported

Conclusion

From the research results, knowledge management significantly and directly affects knowledge management and organizational performance that knowledge management could help hi-tech industries cross obstacles. Besides, the implicit knowledge of employees of hi-tech industries could be transformed into explicit knowledge among organizational members through experience sharing, innovation support, and trustful and cooperative culture as well as enhance organizational knowledge management. The promotion of knowledge management presents more flexibility and would be more supported that the employees could automatically participate in knowledge management activity. With the support and application of information technology to knowledge management, a hi-tech industry more largely investing in information hardware, software, and training and applying to management and production could have all employees connect with other employees and even external personnel through information technology to share existing knowledge in the organization under distinct background, enhance employees sharing experiences with other employees, and pass down experiences. These depend on information systems providing real-time and integrated interface platform, positively introducing and applying existing knowledge or new knowledge, seeking for new opportunities and development opportunities to promote knowledge management competence and organizational performance.

Suggestions

By organizing the research results and findings, practical suggestions are proposed as followings.

- (1) Knowledge management should be constantly promoted to present the effectiveness. In this case, it should be combined with the management of a hi-tech industry, regularly inspect the practice effectiveness of knowledge management, and continuously promote internally so that knowledge process could be smoothly operated, the employees could get used to it to generate endless dynamic and easily operate knowledge management.
- (2) A hi-tech industry should create knowledge management activity for the employees stressing on the necessity and importance of knowledge management. Measures to induce actions should be made, such as holding team activity related to knowledge management and knowledge management seminars.
- (3) The culture and mechanism of sharing are the motive of knowledge management. Proper application is the objective of knowledge management. Providing proper knowledge at proper time for people in needs is the major spirit. Accordingly, a hi-tech industry could have the employees inquiring information and sharing experiences and knowledge resources through web as well as provide a cross-organization sharing mechanism to enhance organizational learning, interactive communication, and collaborative operation.
- (4) A hi-tech industry could apply incentives to offer rewards, which should be permanently integrated with employees' performance evaluation and pay structure as financial and non-financial encouragement.

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