International Journal of Business, Human and Social Sciences
ISSN: 2517-9411
Vol:6, No:4, 2012

Factors Influencing Knowledge Management Process Model: A Case Study of Manufacturing Industry in Thailand

Daranee Pimchangthong and Supaporn Tinprapa

***Abstract*—**The objectives of this research were to explore factors influencing knowledge management process in the manufacturing industry and develop a model to support knowledge management processes. The studied factors were technology infrastructure, human resource, knowledge sharing, and the culture of the organization. The knowledge management processes included discovery, capture, sharing, and application. Data were collected through questionnaires and analyzed using multiple linear regression and multiple correlation. The results found that technology infrastructure, human resource, knowledge sharing, and culture of the organization influenced the discovery and capture processes. However, knowledge sharing had no influence in sharing and application processes. A model to support knowledge management processes was developed, which indicated that sharing knowledge needed further improvement in the organization.

***Keywords*—**knowledge management, knowledge management process, tacit knowledge

I. Introduction

THE industrial sector plays an important role in the country development especially during the changes in Thailand. Organizational restructure, mobility of workforce, and early retirement are examples of changes that can lead to lacking of knowledge workers. One of the attempts to keep knowledge, especially tacit knowledge, within the organization is to adopt knowledge management. Knowledge management is a very complex process. Also, knowledge management efforts lack of clarity, lack of evaluation measures, and suffer from many contradictions and competing objectives. Besides, motivating employees to share and transfer knowledge is one of the most difficult tasks. Employees feel that they should hold on to their knowledge, otherwise they will lose their importance and consequently lose their jobs. However, most researchers agree that knowledge management plays a central role in enhancing the capabilities of organizations to innovate by enabling the sharing of tacit knowledge and collaboration both internally and externally across organizational boundaries (Cavusgil et al, [4]).

Daranee Pimchangthong, D.B.A. is an Assistant Professor at Faculty of Business Administration, Rajamangala University of Technology Thanyaburi, 39 Muh 1 Rangsit-Nakornnayok Rd., Klong Hok Thanyaburi, Pathum Thani, Thailand, (phone:+6689-062-1321; fax:+662-549-4836; email:daraneep2002@yahoo.com)

Supaporn Tinprapa is an Assistant Professor at Faculty of Business Administration, Rajamangala University of Technology Thanyaburi, 39 Muh 1 Rangsit-Nakornnayok Rd., Klong Hok Thanyaburi, Pathum Thani, Thailand (phone:+6681-938-1370 fax:+662-549-4836 email:stinprapa@yahoo.com)

In order to motivate sharing tacit knowledge in the organization, appropriate knowledge management processes are needed. This paper attempts to find the factors influencing knowledge management processes and develop a model to support knowledge management processes.

II. Literature Review

Knowledge is a theoretical or practical understanding of a subject or a domain (Negnevitsky [13]). Knowledge is increasingly being recognized as the new strategic imperative of organizations. Knowledge becomes the primary source of competitiveness and innovation in the composition of commodity chain to the broader processes of regional and national economic development (Barney [1], Bhatt [3], Daniels and Bryson [6], Shapira *et al.*[14]). The new paradigm is that within the organization knowledge must be shared in order for it to grow. Sharing knowledge among its management and staff grows stronger and becomes more competitive (Uriarte [15]). By implementing knowledge management, organizations can increase the capability of managing and utilizing their knowledge, and ultimately achieve superior performance. The advantage of knowledge management is so obvious in a variety of business, industry, etc. Herschel and Jones [8], and Lo and Chin [9] describe that knowledge management enhances business intelligence, sharing the intelligence among organizational members about how to effectively perform the variety of functions required to make organizational improvement.

Becerra-Fernandez and Sabherwal [2] identify that knowledge management relied on four main kinds of knowledge management processes as follows: discovery, capture, sharing, and application. The relations of the processes are shown in Fig. 1.

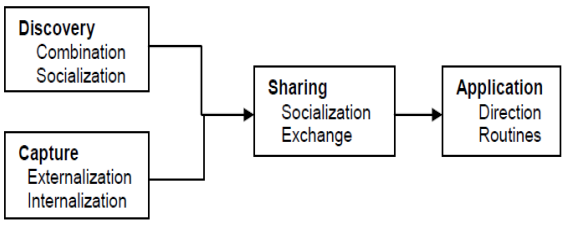

Fig. 1 Knowledge management process

Knowledge Discovery is defined as the development of new tacit or explicit knowledge from data and information or from the synthesis of prior knowledge. Knowledge Capture is defined as the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities. Knowledge Sharing is the process through which knowledge is communicated to other individuals. Knowledge Application depends on the availability of knowledge.

Knowledge management can impact organizations and organizational performance at several levels: people, processes, products, and the overall organizational performance (Becerra-Fernandez and Sabherwal [2]).

Mohammed and Jalal [11] describe the main factors that influenced and improved the knowledge management (KM) performance positively and they are as what Davenport and Klahr et al. [7], Moffett et al. [12], and Chong and Choi [5] defined: technology infrastructure, human resource, knowledge sharing, and the culture of the organization.

III. Methodology

This research collected data from the operational level employees that worked in the production line of large manufacturing plants that had more than 600 employees. The convenience sampling method was used to collect data. Questionnaires were distributed to 10 manufacturing plants through supervisors, 40 samples each, for a total of 400 research samples.

The questionnaires were categorized into 2 parts. In the first part, there were 20 questions about factors influencing knowledge management as follows: technology infrastructure, human resource, knowledge sharing, and the culture of the organization. In the second part, there were 20 questions about knowledge management process as follows: discovery, capture, sharing, and application. The questionnaires used interval rating scale measurement. The Cronbach's alpha value for reliability test of the questionnaires was 0.9157.

Inferential statistics used to analyze data was multiple linear regression at the statistical significant level of 0.05.

The hypotheses were that factors including technology infrastructure, human resource, knowledge sharing, and the culture of the organization correlated, and influenced knowledge management in discovery, capture, sharing, and application processes.

IV. Results

The multiple correlation results found that knowledge management in dependent variables which included discovery, capture, sharing, and application processes had R value of 0.697, 0.678, 0.668, and 0.640 respectively which interpreted that the correlation between predictors and dependent variables were quite high in the same direction. The percentages of forecasting equation for discovery, capture, sharing, and application processes were 48.10, 45.20, 43.70, and 40.40 respectively as shown in TABLE I

TABLE I
MULTIPLE CORRELATION BETWEEN PREDICTORS AND DEPENDENT VARIABLES

Models	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.697	0.486	0.481	0.347
1	0.678	0.460	0.452	0.416
1	0.668	0.446	0.437	0.425
1	0.640	0.410	0.404	0.455

a Predictors: (Constant), technology infrastructure, human resource, knowledge sharing, and the culture of the organization

The multiple linear regression analysis results found that technology infrastructure (X_1), human resources (X_2), knowledge sharing (X_3), and culture of organization (X_4) influenced knowledge management processes in discovery ($\hat{y}_1$), capture ($\hat{y}_2$), sharing ($\hat{y}_3$), and application ($\hat{y}_4$) at the statistical significant level of 0.05 as shown in TABLE II to TABLE V.

TABLE II
MULTIPLE REGRESSION BETWEEN PREDICTORS AND DISCOVERY PROCESS

Predictors	Unstd. Coeff.		Std. Coeff.	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.265	0.065		6.724	0.000*
(X_1)	0.136	0.074	0.118	2.118	0.010*
(X_2)	0.155	0.102	0.142	2.643	0.006*
(X_3)	0.106	0.083	0.095	1.485	0.042*
(X_4)	0.192	0.048	0.178	2.763	0.000*

a Dependent Variable: Discovery

TABLE III
MULTIPLE REGRESSION BETWEEN PREDICTORS AND CAPTURE PROCESS

Predictors	Unstd. Coeff.		Std. Coeff.	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.322	0.235		4.409	0.000*
(X_1)	0.149	0.024	0.132	2.471	0.018*
(X_2)	0.113	0.021	0.096	1.654	0.021*
(X_3)	0.111	0.016	0.088	1.559	0.030*
(X_4)	0.190	0.038	0.183	2.596	0.007*

a Dependent Variable: Capture

TABLE IV
MULTIPLE REGRESSION BETWEEN PREDICTORS AND SHARING PROCESS

Predictors	Unstd. Coeff.		Std. Coeff.	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.907	0.066		5.442	0.000*
(X_1)	0.219	0.052	0.194	3.228	0.001*
(X_2)	0.112	0.021	0.089	1.651	0.022*
(X_4)	0.654	0.037	0.572	4.846	0.000*

a Dependent Variable: Sharing

TABLE V
MULTIPLE REGRESSION BETWEEN PREDICTORS AND APPLICATION PROCESS

Predictors	Unstd. Coeff.		Std. Coeff.	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.636	0.051		8.936	0.000*
(X_1)	0.120	0.073	0.105	1.775	0.021*
(X_2)	0.143	0.018	0.136	2.261	0.009*
(X_4)	0.221	0.042	0.205	3.856	0.000*

a Dependent Variable: Application

TABLE VI
FORECASTING EQUATIONS FOR EACH KM PROCESS

KM Processes	Forecasting Equations
Discovery	$\hat{y}_1 = 1.265+0.136X_1+0.155X_2+0.106X_3 + 0.192X_4$
Capture	$\hat{y}_2 = 1.322+0.149X_1+0.113X_2+0.111X_3 + 0.190X_4$
Sharing	$\hat{y}_3 = 1.907+0.219X_1+0.112X_2+0.654X_4$
Application	$\hat{y}_4 = 1.636+0.120X_1+0.143X_2+0.221X_4$

Table VI shows the multiple linear regression equation which can be interpreted that culture of organization (X_4) had highest influence in all KM Processes.

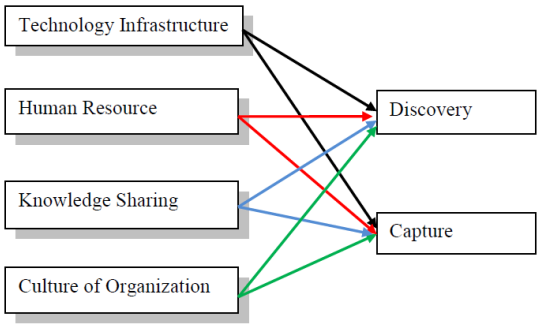

Fig. 2 Factors influencing knowledge management in discovery and capture processes

Fig. 2 shows the finding model to support knowledge management in discovery and capture processes. Factors including technology infrastructure, human resource, knowledge sharing, and culture of organization influenced discovery and capture processes.

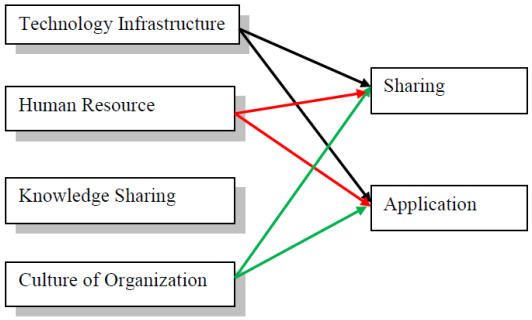

Fig. 3 Factors influencing knowledge management in sharing and application processes

Fig. 3 shows the finding model to support knowledge management in sharing and application processes. There were only three factors including technology infrastructure, human resource, and culture of organization that influenced sharing and application processes.

V. Conclusion

The interesting finding illustrated that knowledge sharing had no influence in two knowledge management processes, which were sharing and application. This implies that there is still resistance to sharing knowledge among employees. In order to keep tacit knowledge in the organization to further develop explicit knowledge, the organization should find ways to motivate employees to share knowledge.

Organizational culture indicated highest influences on the knowledge management processes in this study. However, it may be different in other cultures and countries; the same study in different cultures should be performed.

Since the scopes of this study were at the operational level and tacit knowledge, the finding model could be more generalized by applying with sharing both tacit and explicit knowledge. The sample groups should have more variety and more in the professional and management level due to having high mobility.

Factors influencing knowledge management process may be different when applied to other sample groups from different business and industrial sectors. Therefore, the developed model should be further tested with different dimensions in both positional level and business sectors for stability.

References

[1] Barney, J.B., "Looking inside for competitive advantage", The Academy of Management Executive, Vol. 9 No. 4, 1995, pp. 49-61.
[2] Becerra-Fernandez, I. and Sabherwal, R., "Knowledge Management: Systems and Processes", M.E. Sharpe, Inc., 2008.
[3] Bhatt, G.D., "Organizing knowledge in the knowledge development cycle", Journal of Knowledge Management, Vol. 4 No. 1, 2000, pp. 15-26.
[4] Cavusgil, S. T., Calantone, R. J., & Zhao, Y. ,"Tacit knowledge transfer and firm innovation capability", Journal of Business and Industrial Marketing, 18(1), 2003, pp. 6–21.

[5] Chong, C., and Choi, S., Critical Factors in the Successful Implementation of KM. Journal of Knowledge Management Practice, 2005, [Online] Available: http://www.tlainc.com/article90htm.
[6] Daniels, P.W. and Bryson, J.R., "Manufacturing services and serving manufacturing: knowledge-based cities and changing forms of production", Urban Studies, Vol. 39 Nos 5/6, 2002, pp. 977-91.
[7] Davenport, T., and Klahr, P., Managing Customer Support Knowledge. California Management Review, Vol.40, No.3, 1998, pp.195-208.
[8] Herschel, R.T. and Jones, N.E., "Knowledge management and business intelligence: the importance of integration", Journal of Knowledge Management, Vol. 9 No. 4, 2005, pp. 45-55.
[9] Lo, K.; Chin, K., "User-satisfaction-based knowledge management performance measurement", The International Journal of Quality & Reliability Management, 2009, 449-468.
[10] Marquardt,M. J., Building the Learning Organization". New York: McGraw-Hill. 1996.
[11] Mohammed, Wafa; Jalal, Akram, "The Influence of Knowledge Management System (KMS) on Enhancing Decision Making Process (DMP)", International Journal of Business and Management 6. 8 , 2011, pp. 216-229.
[12] Moffett, S., McAdam, R., and Parkinson, S., "An Empirical Analysis of Knowledge Management Applications", Journal of Knowledge Management, Vol. 7, No.3, 2003, pp.6-26.
[13] Negnevitsky, M., "Artificial Intelligence Systems: A Guide to Intelligent Systems", Pearson Education Limited, 2005.
[14] Shapira, P., Youtie, J., Yogeesvaran, K. and Jaafar, Z., "Knowledge economy measurement: methods, results and insights from the Malaysian Knowledge Content Study", Research Policy, Vol. 35 No. 10, 2006, pp. 1522-37.
[15] Uriarte, F., "Introduction to Knowledge Management", ASEAN Foundation, Jarkatar, Indonesia, 2008.