A STRUCTURAL EQUATION MODEL OF KNOWLEDGE MANAGEMENT STRATEGY TO DEVELOP BEST PRACTICE FOR INDUSTRIAL BUSINESS IN THAILAND

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ABSTRACT

Aim: *This research investigates the characteristics of industrial business enterprises and develops best practice of knowledge management strategy for industrial business in Thailand.*

Methodology: *The model has been simulated from the findings of both qualitative and quantitative of 500 questionnaires distributed to managers/administrators of the industrial business enterprises in Thailand that won the global or nation knowledge management rewards. The data were analysed by descriptive analysis categorized into light and heavy industries, and by SEM to conduct the model in compatible with the empirical data.*

Finding: *The results reveal that: 1) the structural equation model of knowledge management strategy to develop best practice for industrial business in Thailand consists of 5 factors i.e. leadership, organization, resource, internal information and external information. The managers/administrators gave very high importance on knowledge management strategy in industrial business at 4.14 on light industry and 3.80 on heavy industry respectively. The analysis of the importance on each aspect shows high importance on knowledge management strategy in all factors 2) The development of SEM shows that the model fits with the empirical data at the 0.104 Chi-square probability levels, relative Chai-square at 1.140, goodness of fit index at 0.963 and root mean square error of approximation at 0.017. 3) The hypothesis results show the following influencing factors: leadership has direct influence on organization at the statistically significant level of 0.001, organization has direct influence on external information at the statistically significant level of 0.001, organization has direct influence on internal information at the statistically significant level of 0.001, internal information has direct influence on resource at the statistically significant level of 0.001 and resource has direct influence on organization at the statistically significant level of 0.05.*

Conclusion: *The knowledge management strategy to develop best practice in industrial business for Thailand comprises five main factors which are very high important on leadership in industrial business of both light and heavy industries. The factors are ranked according to their important levels referred Linkert's scale as follows: leadership, internal information, organization, resource and external information respectively. Both light and heavy industries give the most important factor on leadership to be a strategy in industrial business for Thailand. The evaluation of structural equation modelling of the simulation model in knowledge management showed passing the criteria of the model fitting with the empirical data. It was found that Chi-Square Probability Level equaled 0.104, Relative Chai-square was 1.140, Goodness of fit Index was 0.963 and Root Mean Square Error of approximation was 0.017.*

Keywords: Knowledge Management, Structural Equation Model (SEM), Industrial Business Sector, Thailand.

INTRODUCTION

Nowadays, according to economic information from World Bank report, world economic situation is currently facing global recession as global economic growth rate in 2014 decreases 0.2% from the previous year (World Bank, 2016). During this situation, an organization requires development of skillful and talented human resource with adequate knowledge by investment in human resource development (Swanson, 1995). Sometimes the organization faces skillful and talented human resources turnover, it certainly results in organizational losses of important knowledge (Lahaie, 2005). Previous studies revealed most of important knowledge source of organization is in brain of employee which has the highest proportion equal to 42%. In 2017, employee turnover rate in industrial business in Thailand was 12.89% and developed to increase to 13 – 14% in 2018 (Prachachat Business Online, 2018). The turnover rate harmonizes with employment records from Social Security Office which discovered the number of new hire employees and employees who retired or resigned from their jobs within 6 months. The numbers tend to increase from 2010 to 2018 respectively (Social Security Office, 2019) as shown in Figure 1.

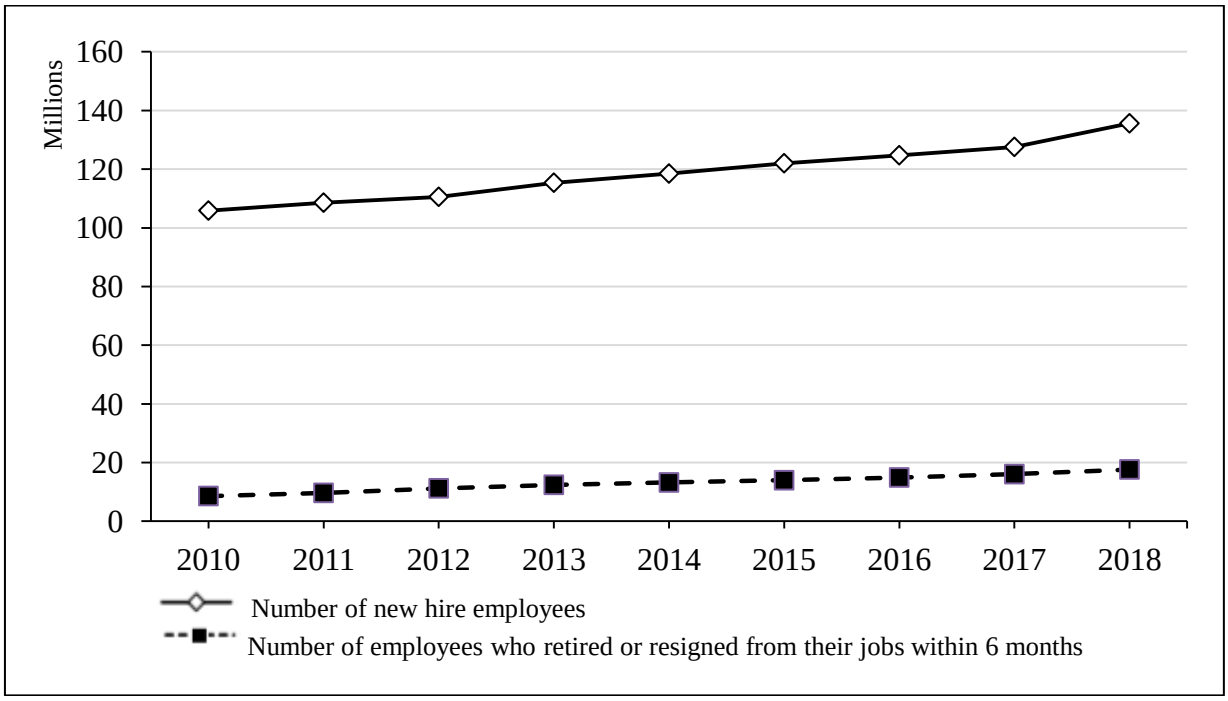

FIGURE 1
GRAPH FOR NUMBER OF EMPLOYMENTS RECORD FROM THAILAND SOCIAL SECURITY OFFICE SINCE YEAR 2010-2018

Due to increasing of number of staff members quitting, organizations have huge chances to lose organizational knowledge in the staff member as well. So, how can the organizations extract the knowledge from them and transfer to the new staff members as soon as possible? It is

accounted for the increase of personnel work effectiveness and organizational cost reduction from new staff's development at the same time (Vijarn, 2014). Therefore, many organizations agree that an essential item for their organizational development is knowledge which needs to be saved and turned into knowledge asset of the organizations (Peeraya, 2006) by using what is so called *"Knowledge Management*".

Leadership

A leader is a person who influences a group of people towards the achievement of goal. To be a leader, a person is able to persuade and motivate the others to complete their jobs and guide the realization of expected benefits from achievement (Zattoni et al., 2015). The person who is an expert in administration and implementation, must be intellectual and understands the core and techniques of motivation psychology and personal problem solving etc. in order to apply using them for gentle work and staff management resulting in both job and personnel success (Mintzberg, 2013). Also the leader can provide both internally and externally training opportunities for followers to increase their knowledge, potential and capabilities. Afterward the leader can transform organization toward a learning organization with solid network by driven successfully with the leader's creativity and vision (Yukl, 2008). With the reasons above, it can be concluded that leadership is essential for successful implementation of knowledge management (Gencer, 2012) and able to develop strategy for competitive advantage and key success. Leadership is considered as the key to success to drive knowledge management in the organization. Thus, the organization should emphasize on leadership especially in types of leader who is able to be a role model for knowledge management (Singh, 2008).

Organization

Organization means formal types of relationship between an individual and a group relating to the assignment of duties and responsibilities including authorities in the organization (Greenberg & Zhang, 2010). It consists of 3 important dimensions: 1) Top manager (Strategic Apex) who is the most important in the organization as he plays vital roles for the determination of organizational success or failure. 2) Middle Manager (Middle Line) including technostructure and support staff who are integral mechanism for coordinating activities in the organization and 3) Practitioner (Operative Core) as shown in Figure 2 (Lunenburg, 2012).

For organization and creative working behavior, business sectors are now finding out the way to reduce operational expenses. Downsizing is one of popular guidelines, however, it sometimes effects on the corresponding organizational re-structuring and negatively results in performance of employee (ur Rehman & Naeem, 2012). The study of Jin & Levis (1990) shows that high hierarchical organizational structure limits decision maker choices and member's choices. The result of Shafaee et al. (2012) shows that organizational structure effects on organizational engagement and work satisfaction of staff. As the aforementioned, it can be summarized that organizational structure is required for data flow for knowledge exchange. In case of inconsistent organizational structure with data flow direction, the barrier of knowledge sharing and collection within the organization is built (O'Dell et al., 1998). Nonaka & Takeuchi (1995) points out that re-development of organizational structure can help improving more efficient process of knowledge initiation.

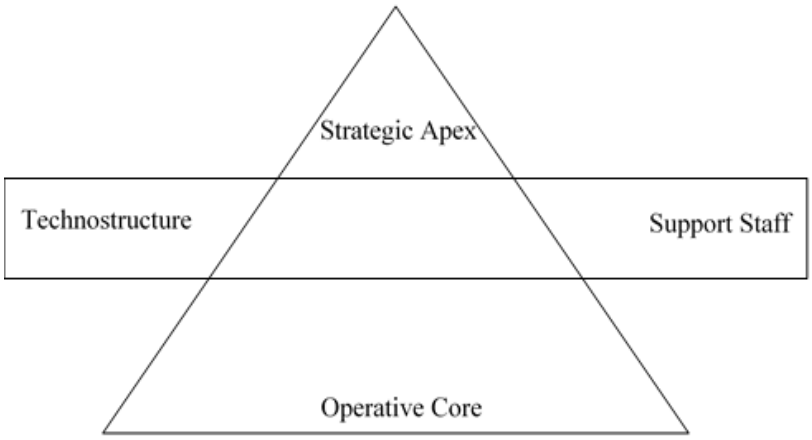

FIGURE 2
ORGANIZATIONAL STRUCTURE: MINTZBERG'S FRAMEWORK

Resource

Fundamental resource for knowledge management consists of 4 elements called KP_2T: Knowledge, People, Processes and Technology to drive the achievement of knowledge management in the organization (Desouza & Pacquette, 2011). Due to adequate resources, knowledge creativity and access are improved and supported (Wild & Griggs, 2008).

Human resource management means policy and implementation relating to working persons especially about training search, performance appraisal, and rewarding, equal orientation of safety, ethics and justice for organizational staff brings about the organizational achievement of efficient internal implementation (Becker, 2002). According to the definition of human resource management, it can be said that human resource management orientation means decision-making process and implementation relating to every level of personnel so that they will have the highest performance resulting in the achievement of organizational goals. Relating processes are human resource planning, work analysis, recruitment, selection, training, motivation, acquisition, development of personnel knowledge and capabilities and rewarding to stimulate organizational loyalty.

Internal Information

Internal information management starts from having organizational culture making learning management as a center that can improve potential of knowledge management (De Long, 1997). Leonard-Barton & Knowledge (1995) points out that an important component of organizational culture is corporate vision as it aims to define explicit objectives of the organization and readiness for necessary changes in order to achieve the goals of knowledge management (Nonaka & Takeuchi, 1995).

Administrative process consists of 5 management functions according to Henri Fayol's concept: 1) Planning is the prediction of what shall effect on the business and then finding practices, 2) Organizing is the arrangement of organizational structure into sub units with obvious authorities followed by personnel recruitment and selection, 3) Commanding is to order staff to complete their assignments, 4) Co-ordinating is a duty to smoothly coordinate everyone's

work without conflicts and aim to the same goals and 5) Controlling is to govern each assignee's work under the defined scope (Henri, 1916). It is therefore concluded that, internal information management can cause the learning center and improve the potential of knowledge management orientation (De Long, 1997) as it is an important tool for finding, collecting, maintaining and improving knowledge for the organizational capabilities of knowledge management (Khalifa & Liu, 2003 and Fan et al., 2009).

External Information

External cooperation is originated from culture of national knowledge management. It is an important part affecting on the achievement of knowledge management in the organization (Al-Fehaid, 2014) as well as directly transferred knowledge to the customer can help easier success of knowledge management (Vasireddy, 2016). Therefore, business alliance of the organization is needed.

Business alliance is the closely-cooperating relationship among more than 2 organizations for the determination to achieve goals by implementing an activity together with mutual benefits (Spekman, Isabella and McAVOY, 2000), build up good relationship between the organizations, formally and informally interact on the cooperation including inter-organizational trust. Relationship between organizations in term of long-term cooperation causes benefit sharing leading to learning, technology improvement, management, practical quality control and efficiency improvement of technology transferring (Wong, 1991; Capannelli, 1997; Nishiguchi, 1994; Petison & Johri, 2008)

On the basis of extensive literature review, knowledge management for execution of industrial and related research summarized in followed topics.

Nonaka & Takeuchi (1995) suggested theory of knowledge management called *"SECI Cycle"*. It means that the organization needs regular socialization among staff members. The socialization is personnel's tacit knowledge exchange (Tacit to Tacit) or experiences from communication which was built to be each person's knowledge via cooperation with their colleagues by observation, involvement, thinking and action. Extraction process of tacit knowledge from talented, educated and expert staff (Externalization) is provided to obtain the most explicit knowledge (Tacit to Explicit). It transforms the transferring of tacit or specific knowledge to the explicit knowledge via talking. Telling stories is an important process of knowledge construction. Then, such explicit knowledge is collected into categories (Combination) and exchanged to more explicit knowledge (Explicit to Explicit) for transferring and training to other staff. It is the process that practically makes use of such knowledge until it is internalized deep in a person (Internalization) finally leading to personal knowledge (Explicit to Tacit) so that the staff members are able to apply their explicit knowledge and turn it into products, processes, methods, or improvement of previous jobs toward value-added ones. Such processes will be repeated as an endless cycle. It is a knowledge sharing process between tacit and explicit knowledge leading to Knowledge Spiral which will benefit the organization.

In Thailand, the Knowledge Management Institute (KMI) presented a simple knowledge management model by comparing knowledge to a tuna diagram which consists of 3 parts called *"Tuna model"*. Tuna head is compared to be the organizational leader's goals, visions, or knowledge management direction (Knowledge Vision: KV). Tuna body is an important part for stimulating Knowledge Sharing (KS) especially personnel tacit knowledge, creating atmosphere for team learning resulting in knowledge circulation and improvement of knowledge and innovation. The last part, tuna tail is accumulated knowledge storage (Knowledge Assets: KA).

Tips from knowledge sharing process in tuna body are collected at its tail by various methods. It is the extraction of tacit toward explicit knowledge which will be publicized and exchanged for improvement (Prapon, 2006).

Concept of Singapore Productivity and Standard Board (2001: 38-39) referred in Boondee & Nongluck (2006) showed that important elements of knowledge management are human, technology and knowledge process. *"Human"* is considered as the most important as it is the source and makes use of the knowledge. *"Technology"* is a tool for staff to search, download, share and make easy and quick use of the knowledge. *"Knowledge Process"* is the management to transfer knowledge from the source to users for improvement and innovation.

According to the aforementioned reasons, the researcher is therefore interested in the development of structural equation model of strategy for knowledge management in industrial business sector by studying 5 elements significantly effecting on the achievement of knowledge management: Leadership, Organization, Resource, Internal Information and External Information to enhance organizational capabilities of successful knowledge management in industrial business sectors in Thailand.

Objectives

To develop simulation model for knowledge management strategy in industrial business for Thailand.

HYPOTHESES

In the light of the information obtained from the literature review, the research hypotheses were designed into 5 hypotheses:

H_1 *Factor on leadership has direct influence on organization factor.*

Study of Chan et al. 2019 on the effect of transformational leadership on organizational restructuring shows that leadership significantly effects on transformational innovation of organization in production industry as it also directly effects on subordinates. Corresponding to study of Hussain et al. (2018), it was found that leadership and staff's involvement lead transformation of organizational structure in knowledge sharing.

H_2 *Factor on resource has direct influence on organization factor*.

When chief executive leader of the organization would like to communicate important messages to staff in each level, the specification of uncomplicated organizational structure will cause communication effectiveness due to technology (Homan, 2015) corresponding to the study of Garg (2010) which shows the effect of organizational resource planning on productivity in information technology organizations. As a result, it was found that technology is resource used in the organization for the highest effectiveness when the specification of organizational structure is corresponding to the technologies. Conforming to the study of Čudanov et al. (2012) which examines the use of technology as learning and understanding tool for organizational transformation shows that technology effects on organizational transformation. In order to enhance the effectiveness of technology used in learning management, organizational transformation relating to reporting and internal communication process is needed.

H_3 Factor on organization has direct influence on external information factor.

The study of Vasireddy (2016) examining how to manage knowledge in order to get customer's 360-degree aspect shows that in case the organization has horizontal organizational structure, the customer will cooperate well corresponding to the study of Edelman & Singer, 2015 showing that the efficient cooperation between organizational structures can lead to good relationship with external organization especially customers.

H_4 Factor on organization has direct influence on internal information factor.

Uncomplicated organizations effect on less formality and enable smoother data flow in the organization (Alshahrani, 2018). When knowledge in the organization needs to be developing efficiently, it must be started from the leader positively and regularly supporting initiation. Organizational structure with reduced steps will not obstacle to communication and well enhance the effectiveness of internal organization implementation (Tyack, 2019).

H_5 Factor on internal information has direct influence on resource factor.

The survey of internal information used as fundamental information for resource recruitment and technology facilitates higher success in knowledge management (Wangdu et al., 2018) together with personnel capabilities and skills in using technology of internal information management which defines the direction in choosing resources used for the organizational highest effectiveness (Rabogadi, 2017).

METHODOLOGY

This study has been designed as an inductive research with mixed methodology.

1. Qualitative Research using In-depth Interview technique with 9 experts including 3 experts in knowledge management business organization managers, 3 experts in human resource development government department and 3 independent scholars in knowledge management academic with structured interview from as opened-end questions followed the concept of five latents which reviewed from theory and literature. The five latents comprised of 1) Leadership 2) Organization 3) Resource 4) Internal Information and 5) External Information. These variables were evaluated the index of the corresponding with objective or content using Item Objective Congruence; IOC analysis that showed 0.60-1.00 value (accepted at >0.5). Finally we obtained the suitable 107 variables in 5 latents for try-out questionnaire that evaluated the reliability from Cronbach's Alpha statistic showed at 0.980 (accepted at >0.8) and discrimination both check-list and rating-scale question items (accepted at >0.3) using Standard Deviation (S.D.) analysis obtained 0.55-1.26 and Corrected Item-Total Correlation analysis obtained 0.32-0.83 respectively.
2. The quantitative research used questionnaire surveys with managers/administrators of industrial business enterprises in Thailand that won the global or nation industry rewards in knowledge management from 2000-2017, conduct a period of seven months to collect the data from 813 surveys. The 500 samples (Comrey & Lee, 1992) for statistical analysis consist of 250 data by responding to heavy industries and 250 data from light industries. The research tools for quantitative survey questionnaires were. Data analysis was conducted through descriptive statistics by SPSS referred 5 Likert's scales (Tanin, 2017). Multivariate Statistical Analysis employed Structural Equations Model (SEM) by AMOS with evaluating the Data-model Fit in 4 levels including (1) Chi-square Probability Level over 0.05 (2) Relative Chi-square less than 2 (3) Goodness of fit Index over 0.90 and (4) Root Mean Square Error of Approximation less than 0.08.
3. The model of knowledge management strategy in industrial business approved by 7 experts using focus group analysis techniques in qualitative research.

RESULTS

The results of this research in relation to the factors affecting and the simulation model of knowledge management of industrial business for Thailand could be further discussed as follows:

Table 1
MEAN AND STANDARD DEVIATION THE MANAGEMENT FACTORS IN KNOWLEDGE MANAGEMENT IN INDUSTRAIL BUSINESS FOR THAILAND

Factors of simulation model for knowledge management strategy in industrial business	Light industry			Heavy Industry		
	$\bar{x}$	S.D.	Significant level	$\bar{x}$	S.D.	Significant level
Overall	4.14	0.29	High	3.80	0.40	High
1. Leadership	4.22	0.29	High	3.84	0.43	High
2. Organization	4.12	0.33	High	3.79	0.40	High
3. Resource	4.12	0.32	High	3.77	0.45	High
4. Internal Information	4.18	0.33	High	3.81	0.44	High
5. External Information	4.07	0.29	High	3.79	0.39	High

1. The administrators of both light and heavy industries gave the importance on knowledge management in industrial business for Thailand by reporting 5 factors shown in Table 1. Table 1 presents factors in simulation model for knowledge management strategy in industrial business showing high importance of both light and heavy industries at 4.14 and 3.80 respectively. When considering in each aspect for light industry, the importance is on every factor with the highest on leadership at 4.22 followed by internal information at 4.18; then resource at 4.12 (S.D. = 0.32), organization at 4.12 (S.D. =0.33) and external information at 4.07 respectively. For heavy industry, the administrators gave high importance on every factor with highest on leadership at 3.84 followed by internal information at 3.81; then external information at 3.79 (S.D. =0.39), organization at 3.79 (S.D. =0.40) and resource at 3.77 respectively.
2. The comparison of important level of knowledge management strategy in industrial business for Thailand between light and heavy industry using independent t-test statistic in SPSS statistical program showed the statistically significant difference between mean of factors important level of light and heavy industry.
3. The evaluation of structural equation modelling of the simulation model in knowledge management showed that the Chi-square probability level was at 0.000; relative Chi-square at 1.788, goodness of fit index at 0.904, and root mean square error of approximation at 0.040 which still could not pass the criteria of the SEM.

Thus, the researcher revised the simulation model by considering modification indices suggested by Arbuckle (2011). After the revision of the simulation model, it was found that Chi-Square Probability Level equalled 0.104, Relative Chi-square was 1.140, Goodness of fit Index was 0.963, and Root Mean Square Error of Approximation was 0.017 passing the criteria of the model fitting with the empirical data as shown in Figure 3.

From Figure 3, the analysis result of structural equation model of knowledge management strategy in industrial business found the important statistic value were factor loading in standardized estimate mode at hypothesis path analysis. The hypothesis 1 (H1) clarify the influencing factors: leadership has direct influence on organization at the statistically significant level of 0.001 at factor loading 0.75. The hypothesis 2 (H2), resource has direct influence on organization at the statistically significant level of 0.5 at factor loading 0.31. The hypothesis 3 (H3), organization had direct influence on external information at the statistically significant level of 0.001 at factor loading 1.03. The hypothesis 4 (H4), organization had direct influence on internal information at the statistically significant level of 0.001 at factor loading

1.04. The hypothesis 5 (H5), internal information had direct influence on resource at the statistically significant level of 0.001 at factor loading 0.85. Statistical analysis of structural equation model for knowledge management strategy in industrial business in standardized estimate mode is shown in Figure 3 and summarized in Table 2.

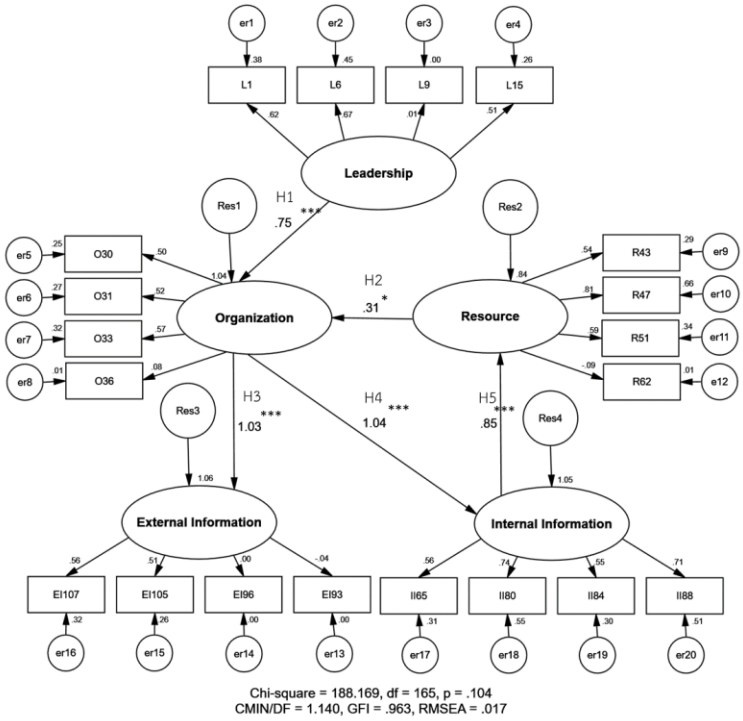

FIGURE 3
SIMULATION MODEL FOR KNOWLEDGE MANAGEMENT STRATEGY IN INDUSTRIAL BUSINESS IN STANDARDIZED ESTIMATE MODE

Table 2 represented the estimate regression weight between factors of simulation model, squared multiple correlations (R^2) identify the statistical relation between variables and P-values as a statistical criteria for evaluating the significant level between variables. The results of latent variable analysis on observational variables can be explained as follows;

The factor loading of leadership factor consists of the flowing sub-factors: encouragement of professionalism in various aspects (L6) of 0.67, opening minds for any opinion from diversity point of view (L1) of 0.62, establishing vision, mission and direction for internal knowledge management (L15) of 0.51, and ability to motivate staff to empathize on knowledge sharing (L9) of 0.01.

The factor loading of organization factor consists of knowledge management organization structures for cross function of knowledge exchange (O33) of 0.57, appointment knowledge team member with clear specific of name, last name, position and responsibility (O31) of 0.52, rotation of knowledge management facilitator from different job function (O30) of 0.50, and mentoring system for new hire member (O36) of 0.08.

The factor loading of resource factor consists of setting up knowledge management annual planning (R47) of 0.81, Knowledge index for easy searching (R51) of 0.59, central data

base and storage system (R43) of 0.54, and providing utilities in communication covering in workforce (R62) of -0.99.

Table 2
STATISTICAL ANALYSIS OF STRUCTURAL EQUATION MODEL FOR KNOWLEDGE MANAGEMENT STRATEGY IN INDUSTRIAL BUSINESS IN STANDARDIZED ESTIMATE MODE

Variable	Estimate		R^2	P
	Standard	Unstandardized		
Leadership				
Organization	0.75	0.79	1.04	***
Organization				
Internal Information	1.04	1.14	1.05	***
External Information	1.03	1.06	1.06	***
Internal Information				
Resource	0.85	0.71	0.84	***
Resource				
Organization	0.31	0.33	1.04	0.03*
Leadership				
L1	0.62	1.00	0.38	
L6	0.67	1.53	0.45	***
L9	0.01	0.01	0.00	0.91
L15	0.51	0.98	0.26	***
Organization				
O30	0.50	1.00	0.25	
O31	0.52	0.84	0.27	***
O33	0.57	1.09	0.32	***
O36	0.08	0.23	0.01	0.11
Resource				
R43	0.54	1.00	0.29	
R47	0.81	1.96	0.66	***
R51	0.59	1.15	0.34	***
R62	-0.09	-0.32	0.01	0.06
Internal Information				
II65	0.56	1.00	0.31	
II80	0.74	1.54	0.55	***
II84	0.55	0.91	0.30	***
II88	0.71	1.44	0.51	***

Noted: ***Significant level at 0.001; *Significant level at 0.05

The factor loading of internal information factor consists of knowledge management communication via e-mail in intranet system (II80) of 0.74, self-web base learning center (II88) of 0.71, using statistical analysis of data (II65) of 0.56, and implementing business socialize application for knowledge exchange web base (II84) of 0.55.

The factor loading of external information factor consists of knowledge management collaboration for positive image of organization (EI107) of 0.56, seeking new benchmark among similar business for the best practice (EI105) of 0.51, advertising in social media for knowledge sharing (EI96) of 0.00, and adopt external knowledge management vision and applying in organization (EI93) of -0.04.

DISCUSSION

From the result of the difference important of five factors on knowledge management strategy to develop best practice for industrial business in Thailand between the light and heavy industrial sectors at 0.05 significant level, in light industry sector gave the important level in leadership factor was highest priority ($\bar{x}$=4.22) that slightly differ from internal information factor ($\bar{x}$=4.18) (see in Table 1), followed by resource, organization and external information respectively. Heavy industry gave highest important level on leadership factor ($\bar{x}$=3.84) followed by internal information factor ($\bar{x}$=3.81), external information, organization and resource respectively. Both of industry business sector gave highest important level in leadership factor because the effect of leadership on transformation is high important in achievement of knowledge management in organization (Gencer, 2012). Leader has ability to develop strategy for competitive advantage and successful (Bixler, 2002). Leadership is considered as the main factor to drive value of knowledge management in organization (Singh, 2008). Therefore, organization needs strategy of knowledge management to emphasize on types of leadership who can be a role model for knowledge management. Secondly, the simulation model results the highest factor loading is organization direct influence on internal information at the statistically significant level of 0.001 at factor loading 1.04. This result conforms to studies done by Alshahrani (2018) found that the effective flow of knowledge depends on complexity of organizational structure. Organization has less hierarchical organizational structure, will encourage to knowledge exchange within the organization.

CONCLUSION

The knowledge management strategy to develop best practice for industrial business in Thailand comprises 5 main factors which are very important on knowledge management in industrial business of both light and heavy industries. The factors are ranked according to their important levels as follows: leadership and internal information in order to be knowledge management strategy to develop best practice for industrial business in Thailand.

Though, the light industrial sector gives the importance on leadership at the highest factor, followed by internal information at 4.22 and 4.18 respectively. While, the heavy industrial sector gives the importance on leadership at the highest factor and followed by internal information at 3.84 and 3.81 respectively. The researcher found leadership was the highest important level for both light and heavy industrial sectors because the leadership is considered as the main factor to motivate and drive people in the organization. Leader can be a role model for emphasize on knowledge management.

Another important sub-factor in leadership factors is open mind of leader to listen all opinions from diversity point of view. The researcher found one of the most important characteristics of leader which is being open-minded. It is being able to see another's point of view and evaluating not whether it is right or wrong, but whether it works or not. An open minded leader will open to finding out more than exploring and actively being open and curious is the key for knowledge management.

Suggestion for Further Study

The leadership is the key to success of knowledge management in the organization which is the most important discovery in this study. Moreover, the researcher recommends the

there should be an in-depth study on learning culture to become a learning organization. The learning culture is one with organizational values, system and practices that support and encourage both individuals, and the organization, to increase knowledge, competence and performance levels to be sustain in industrial business. In the learning organization, employees continually create, acquire, and transfer knowledge-helping their company adapt to the unpredictable faster than rivals can.

REFERENCES

Al-Fehaid, A.M. (2014). *Influence of national culture on knowledge management*. Unpublished doctoral dissertation, The George Washington University.

Alshahrani, A.S. (2018). Critical success factors of knowledge management in higher education institutions: a comparative study between Western Sydney University in Australia and King Fahd Security College in Saudi Arabia.

Arbuckle, J.L. (2011). *IBM SPSS Amos 20 user's guide.* New York : IBM.

Becker, G.S. (2002). *The age of human capital*.

Bixler, C.H. (2002). Applying the four pillars of knowledge management. *Km World*, *11*(1), 10-20.

Boondee, B., & Nongluck, P. (2006). Knowledge management from theories to practices. Bangkok: Thai Productivity Institute.

Capannelli, G. (1997). Buyer-supplier relations and technology transfer: Japanese consumer electronics. *Rivista Internazionale Di Scienze Economiche E Commerciali*, *44*, 633-676.

Chan, S.W., Ang, S.F., Andleeb, N., Ahmad, M.F., & Zaman, I. (2019). The influence of transformational leadership on organization innovation in malaysian manufacturing industry. *Int. J Sup. Chain. Mgt*, *8*(2), 971.

Comrey, A.L., & Lee, H.B. (2013). *A first course in factor analysis*. Psychology press.

Čudanov, M., Savoiu, G., & Jaško, O. (2012). Usage of technology enhanced learning tools and organizational change perception. *Computer Science and Information Systems*, *9*(1), 285-302.

De Long, D. (1997). Building the knowledge-based organization: How culture drives knowledge behaviors. *Centers for Business Innovation*.

Desouza, K.C., & Pacquette, S. (2011). *Knowledge management: An introduction*. Neal-Schuman Publishers.

Edelman, D.C., & Singer, M. (2015). Competing on customer journeys. *Harvard Business Review*, *93*(11), 88-100.

Garg, M. (2010). *Impact of enterprise resource planning on organizational productivity in an information technology organization*. ProQuest LLC. 789 East Eisenhower Parkway, PO Box 1346, Ann Arbor, MI 48106.

Gencer, U. (2012). *An analysis of factors affecting the effective use of knowledge management in counter improvised explosive device (C-IED) Operations*. Unpublished doctoral dissertation, Old Dominion University.

Greenberg, J., & Zhang, Z. (2010). *Managing behavior in organizations*. Boston, MA: Pearson.

Henri, F. (1916). Administration industrielle et générale: prévoyance, organisation, commandement, coordination, contrôle. *Dunod et E. Pinat, Paris*.

Homan, J.V. (2015). *Evaluating perceived effectiveness of technologies and methods of communication through multiple organizational levels*. Unpublished doctoral dissertation, Robert Morris University.

Hussain, S.T., Lei, S., Akram, T., Haider, M. J., Hussain, S.H., & Ali, M. (2018). Kurt Lewin's change model: A critical review of the role of leadership and employee involvement in organizational change. *Journal of Innovation & Knowledge*, *3*(3), 123-127.

Jin, V.Y., & Levis, A.H. (1990). *Effects of organizational structure on performance: experimental results* (No. LIDS-P-1978). Massachusetts inst of tech cambridge lab for information and decision systems.

Khalifa, M., & Liu, V. (2003). Determinants of successful knowledge management programs. *Electronic Journal on Knowledge Management*, *1*(2), 103-112.

Lahaie, D. (2005). The impact of corporate memory loss. *Leadership in Health Services*.

Leonard-Barton, D., & Knowledge, W. O. (1995). Building and Sustaining the Source of Innovation. *Harvard Business School Press, Boston, MA*.

Lunenburg, F.C. (2012). Organizational structure: Mintzberg's framework. *International journal of scholarly, academic, intellectual diversity*, *14*(1), 1-8.

Mintzberg, H. (2013). *Simply managing: What managers do—and can do better*. Berrett-Koehler Publishers.

Nishiguchi, T. (1994). *Strategic industrial sourcing: The Japanese advantage*. Oxford University Press on Demand.

Nonaka, I., & Takeuchi, H. (1995). The Knowledge Creating Company: Oxford University Press. *New York*, 995.

O'Dell, C.S., O'dell, C., Grayson, C.J., & Essaides, N. (1998). *If only we knew what we know: The transfer of internal knowledge and best practice*. Simon and Schuster.

Peeraya., P. (2006). *Knowledge management (KM)*. Retrieved April 15, 2016 from http://services.dpt.go.th /dpt_kmcenter/index.php?option=com_content&task=view&id=62&Itemid=1

Petison, P., & Johri, L. M. (2008). Dynamics of the manufacturer-supplier relationships in emerging markets. *Asia Pacific Journal of Marketing and Logistics*.

Prachachat Business Online. (2018). Higher salary – more choices, Mercer points out 14% of workers tending to quit their jobs. Retrieved December 3, 2018, from https://www.prachachat.net/csr-hr/news-257526

Prapon., P. (2006). *Knowledge Management, Knowledge Management Institute (KMI)*. Bangkok: Yaimai Creative Group, Co., Ltd.

Rabogadi, T.A. (2017). Strategies information and communication technology managers use to build employee competencies.

Shafaee, J., Rahnama, A., Alaei, A., & Jasour, J. (2012). evaluation of the impact of organizational structure and job characteristics on job satisfaction and organizational commitment. *Journal of Basic and Applied Scientific Research*, *2*(3), 2329-2335.

Singh, S. K. (2008). Role of leadership in knowledge management: a study. *Journal of knowledge management*.

Social Security Office. (2019). *Social Security Statistics 2018*. Bangkok. Retrieved from https://www.sso.go.th/wpr/main/privilege/รายงาน_sub_category_list-label_1_130_716

Swanson, R.A. (1995). Human resource development: Performance is the key. *Human resource development quarterly*, *6*(2), 207-213.

Tanin S. (2017). *Research and statistics analysis by SPSS and AMOS*. S.R. Printing Mass Product.

Tyack, C. (2019). *Workforce challenges to a knowledge management initiative implementation*. Unpublished doctoral dissertation, Baker College, Michigan.

ur Rehman, W., & Naeem, H. (2012). The impact of downsizing on the performance of survived employees: A case study of Pakistan. *African Journal of Business Management*, *6*(7), 2429.

Vasireddy, P. (2016). *Customer Knowledge Management in organisations: Developing a practice framework to achieve 360 degree view of customer*. Unpublished doctoral dissertation, University of Bolton.

Vijarn., P. (2014). *What is knowledge management: don't do, don't know "knowledge management for balanced quality"*.

Wangdu, F., Yang, N., & Sharif, S.M.F. (2018). The mediating effect of knowledge internalization on the relationship between dual learning behaviors and technological innovation performance in the hightech enterprises. *In 2018 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*(pp. 943-947). IEEE.

Wild, R., & Griggs, K. (2008). A model of information technology opportunities for facilitating the practice of knowledge management. *Vine*.

Wong, C.P. (1991). Central-local relations in an era of fiscal decline: the paradox of fiscal decentralization in post-Mao China. *The China Quarterly*, *128*, 691-715.

World Bank. (2016). *Global economic prospects*. Retrieved April 08, 2020 from https://openknowledge.worldbank.org/bitstream/handle/10986/23435/9781464806759.pdf

Yukl, G. (2008). How leaders influence organizational effectiveness. *The leadership quarterly*, *19*(6), 708-722.

Zattoni, A., Gnan, L., & Huse, M. (2015). Does family involvement influence firm performance? Exploring the mediating effects of board processes and tasks. *Journal of Management*, *41*(4), 1214-1243.