

KM Approach for Improving the Labor Productivity of Vietnamese Enterprise

Quoc Trung Pham ⁽¹⁾ and Yoshinori Hara ⁽²⁾

{⁽¹⁾ Graduate School of Economics, ⁽²⁾ Graduate School of Management}
Kyoto University, Yoshida-Honmachi, Sakyo-ku, Kyoto 606-8501, Japan
⁽¹⁾ pham.trung@kt4.ecs.kyoto-u.ac.jp, ⁽²⁾ hara@gsm.kyoto-u.ac.jp

Abstract. In knowledge society, knowledge management (KM) is more and more considered a best strategy for improving the labor productivity of an enterprise. However, the effectiveness of KM on labor productivity is not known exactly, especially it depends on the developing level of a country. To find a solution based on KM approach for improving the labor productivity of Vietnamese enterprise, a new model is proposed, which includes knowledge capability, technology capability, KM, employee satisfaction and labor productivity. By analyzing data from Vietnamese enterprises, the model is tested and suggestions for improving the labor productivity of Vietnamese enterprises are made. Some results of data analysis are: KM doesn't have a direct effectiveness on labor productivity, but employee satisfaction positively affects on labor productivity of Vietnamese enterprises; Technology capability is the most important capability affecting on KM, employee satisfaction and labor productivity; KM has a strong effect on employee satisfaction. Besides, some suggestions for improving the labor productivity of Vietnamese enterprises are: organizing frequent meetings for shortening cultural gap between managers and employees, replacing old machines combined with improving employees' self learning skill, improving innovation capability by creating an open culture for encouraging employees to voice their opinions.

Keywords: KM, KMS, Labor productivity, Satisfaction, Vietnamese enterprise.

1. Introduction

Nowadays, human resource management is widely recognized as a major determinant of an enterprise's competitive advantage. Increasing levels of global competition are already affecting Vietnam and other developing countries. The enterprise manager of those countries can no longer compete based on low labor costs and is trying to find other solutions for improving the labor productivity.

After joining WTO in 2007, Vietnamese enterprises meet a lot of difficulties in the struggle to survive and develop in a high competitive environment. Recently, the high rate of the movement of skilled employees makes the businesses become instable and forces them to have a more effective strategy for human resource management to stabilize staff and improve their labor productivity.

According to WEF 2008 [9], three most problematic factors for doing business in Vietnam are: inflation, inadequate supply for infrastructure, and *inadequately edu-*

cated workforce. Based on Global Competitiveness Index 2008, four weak points of Vietnam economy as well as factor-driven economies are Infrastructure, Higher education, Technological readiness and Innovation.

Moreover, according to a survey measuring the ICT maturity of Vietnamese enterprises [7], the quality of Vietnamese human resource is currently at a low level for most types and fields of enterprise. Other statistics in Vietnam also show the same result that skilled laborers are insufficient and unqualified.

In comparison with other countries in Southeast Asia region, the labor productivity of Vietnam is also at a low level as shown in the following chart:

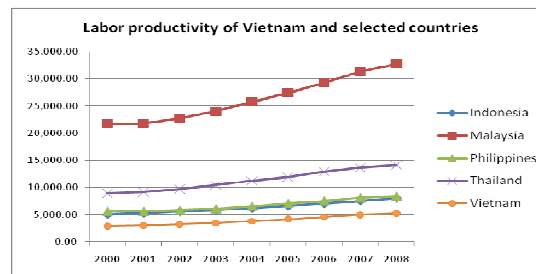


Figure 1. Labor productivity of Vietnam and some other countries (Source: World Bank)

Above facts show that the most important question for Vietnamese enterprises today is how to improve the labor productivity. This problem should be solved by an adaptive method to ensure the sustainable development of those enterprises as well as the whole economy toward a knowledge society.

Today, in knowledge age, knowledge management is considered the best strategy for improving the performance and the productivity of any enterprise. The approach of this paper is exploring knowledge management activity for improving labor productivity. First, a model is specified, then, data collection and analysis are conducted for testing that model. Based on this test, some suggestions for improving labor productivity of Vietnamese enterprise are made. The structure of this paper is organized as follows: (2) Definitions and related works; (3) KM-oriented model and research design; (4) Data collection from Vietnam; (5) Data analysis and result; (6) Solution for improving labor productivity of Vietnamese enterprise; (7) Conclusion.

2. Definitions and related works

2.1. Knowledge capability and knowledge management

There are many definitions of ‘Knowledge capability’, in this paper we use a simple definition of Ning Y. et al. [6] to consider “Knowledge capability includes Core knowledge resource (both explicit and tacit knowledge) and Knowledge operating capabilities (learning capability, culture capability, communication capability and innovation capability)”. This definition is illustrated in the following figure:

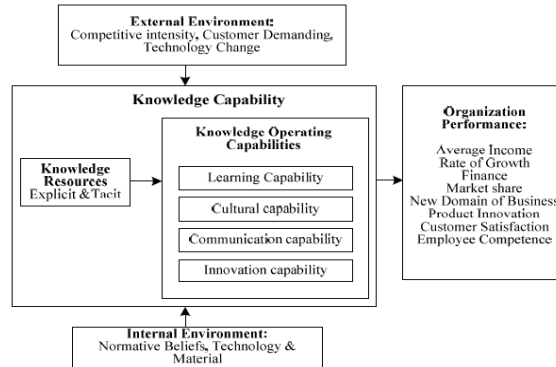


Figure 2. A research model: Knowledge capability and Organization Performance [6]

Core knowledge resource: the core technologies, tacit and explicit knowledge that can be used by an organization to create competitive advantages. Knowledge operating capability: a set of management methods that make the knowledge resource become effective and profitable.

For simplification, knowledge capability can be measured through: (a) Learning capability: include knowledge resources, ability to learn new knowledge of employees and training activities; (b) Cultural capability: whether working environment accept new ideas, be able to renew itself, easily to share and cooperation...; (c) Communication capability: encourage idea exchange, various ideas are often bring together, use IT to facilitate communication; (d) Innovation capability: flexible organizational structure, flexible management system, provide adapted product/service for customer.

Knowledge management aims to apply human-oriented strategy and modern technology in facilitating knowledge processes, such as: knowledge accumulation, knowledge sharing, knowledge utilizing and knowledge creating, in the organization.

Although above model shows a relationship between knowledge capabilities and organization performance, it is not clear enough to be used for a quantitative measurement in practice. Moreover, knowledge management, an important management activity mutually affecting on knowledge capability, is not included in this model.

2.2. Labor productivity

According to OECD, labor productivity is defined as output per unit of labor input. In general, labor productivity can be measured as average real output per hour of labor. Labor productivity can be measured for a firm, a process or a country.

The driving forces behind improvements in labor productivity are the accumulation of machinery and equipment, improvements in organization and infrastructures, improved health and skills of workers and the generation of new technology.

However, labor productivity is hard to be measured exactly because both input and output factors contain intangible values, especially in knowledge work. So that, for a better measurement, labor productivity should be combined with other factors,

such as: employee satisfaction or KM effectiveness, which are considered important factors in motivating people to work and related to employee behavior.

2.3. Previous works related to labor productivity and KM

According to motivation theory of Maslow [5], an important factor motivating people to work is the satisfaction. But, employee satisfaction depends on employee need, which depends on developing level of individual and the organization. Therefore, at different developing level, organization should focus on different ways to increase employee satisfaction as well as labor productivity.

Besides, according to Heskett et al. [2], enhancing internal service quality of an organization (which includes Knowledge capabilities and Technology capabilities) will raise employee satisfaction, which will fuel labor productivity. So, internal capability could play an important role on employee satisfaction and labor productivity.

Moreover, by analyzing data about the ICT maturity of Vietnamese enterprises [7], the result shows that enterprises with high ICT maturity (knowledge management level) get a higher employees' satisfaction rate than those with low ICT maturity as in figure below. Therefore, KM and employee satisfaction must have a correlation.

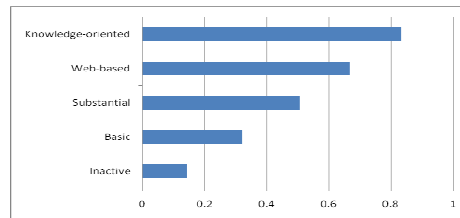


Figure 3. Employee satisfaction and ICT maturity of Vietnamese enterprise

2.4. Problem to be solved

The model in figure 2 is a good starting point for finding the relationship between knowledge capability and final output of an enterprise, such as labor productivity, but that model is not clear enough to identify the important role of KM, an important factor in turning knowledge capability into a real output. Besides, technology capability and employee satisfaction, two important factors affecting on both KM and labor productivity of an enterprise, are not included in that model. So, a new model is needed to measure the effectiveness of KM on labor productivity more exactly.

Moreover, there is a lack of quantitative research for measuring the effectiveness of KM on the labor productivity, especially for developing countries like Vietnam. Therefore, a practical data collection is needed to test the model and to know about the real effectiveness of KM on the labor productivity of Vietnamese enterprises.

In fact, there are many solutions for improving labor productivity of Vietnamese enterprises, but those solutions are not specified clearly enough to be done in practice.

In this research, we focus on KM approach because knowledge are more and more considered important factor in raising the labor productivity of modern organizations. Therefore, some practical suggestions for improving the labor productivity of Vietnamese enterprises based on KM approach are also required.

3. KM-oriented model and research design

3.1. KM-oriented model

From above analysis, some assumptions could be made as follows: KM connects knowledge capability, technology capability and labor productivity ([6], [7] and KM definition); Knowledge capability and technology capability affect on employee satisfaction, which will affect on labor productivity ([2], [5]); KM and employee satisfaction mutually affect on each other ([7]); Technology capability affects on labor productivity (labor productivity definition).

Basing on those assumptions, a new model for improving labor productivity of Vietnamese enterprises is proposed as in the following figure:

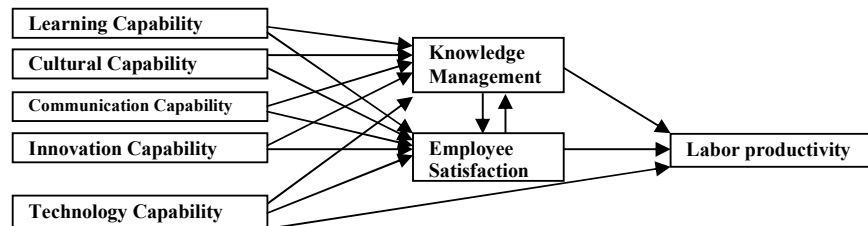


Figure 4. Research model: Knowledge, Technology capability and Labor productivity

Knowledge capability is measured by learning capability, cultural capability, communication capability, and innovation capability. Knowledge management is measured by four main KM processes: knowledge acquisition, knowledge sharing, knowledge utilization, and knowledge creating. Technology capability is measured by technology level and ICT maturity level. Employee satisfaction is measured by employees' feeling mark about their working environment. Labor productivity is measured by average income and working hours per month.

Compare with original model, this model is more detailed and applicable for a quantitative measurement. Some new factors, such as: knowledge management, technology capability, employee satisfaction and labor productivity, are clearly stated. This model can also be used for finding suitable actions to improve employee satisfaction and labor productivity of Vietnamese enterprises based on KM approach.

3.2. Research design

To use this model in practice, the following hypotheses need to be tested:

H1: Knowledge management activity determines the satisfaction of employees.

H2: Learning, Culture, Communication, Innovation, Technology capability and Employees' satisfaction have positive effect on Knowledge management activity.

H3: Learning, Culture, Communication, Innovation, Technology capability and KM have positive effect on the satisfaction of employees.

H4: KM, Employees' satisfaction and Technology capability have positive effect on Labor productivity of an organization.

In order to test this model, a questionnaire is built up to collect data from various employees, who are now working in those enterprises located in Vietnam. The variables for data collection are elements of above model by 5-scale Likert measurement. In this model, eight variables are calculated by the average of their elements. Those variables are: Learning capability (LC), Cultural capability (CC), Communication capability (MC), Innovation capability (IC), Technology capability (TC), Knowledge management (KM), Employee satisfaction (ES) and Labor Productivity (LP). The sample size is intended to be 400 randomly selected employees from those enterprises located in HCMC of Vietnam. The collected data will be used for mean comparison, correlation and regression analysis. Based on data analysis and interviews, suggestions will be made for improving labor productivity of Vietnamese enterprises.

4. Data collection from Vietnamese enterprises

Based on model in figure 4, a questionnaire (see appendix) was made to get data about those factors related to knowledge capability, technology capability, KM, employee satisfaction and labor productivity. Using this questionnaire, a survey was conducted to collect data from those enterprises located in HCMC of Vietnam in two months (4 Jan, 2010 – 27 Feb, 2010). Responding rate is 71.6% with 287 validated responders. Following figures are description statistics of collected data by (1) sex and position of responders, (2) size, field and type of enterprises, (3) monthly salary, working hours, and satisfaction of responders.

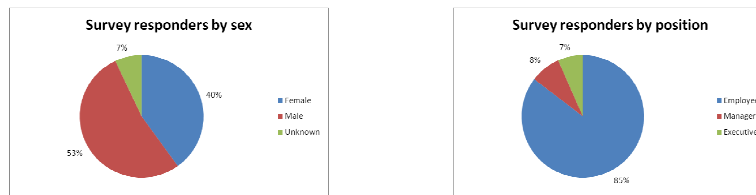


Figure 5. Collected data description statistic by sex and position of responders

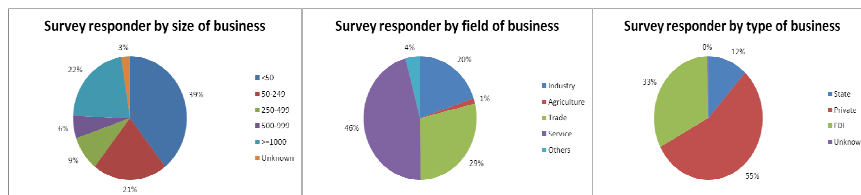


Figure 6. Collected data description statistic by size, field and type of business

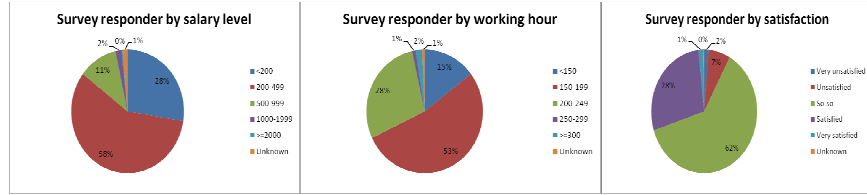


Figure 7. Data statistic by salary level, working hour and satisfaction of responders

From the survey result, average wage level of Vietnamese laborers is low for both SMEs and large enterprises. The highest salary level is in Trade sector for large enterprises and in Industry sector for SMEs.

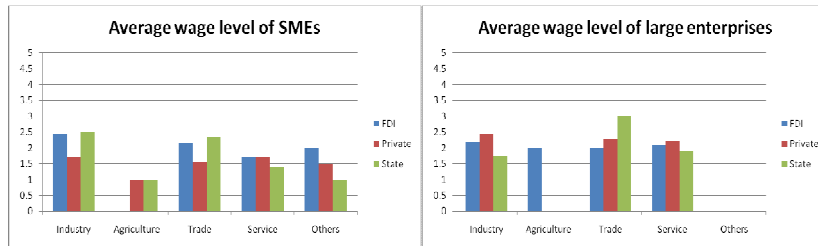


Figure 8. Average wage level of Vietnamese SMEs and large enterprises

Working hour of Vietnamese laborers is low for both kinds of enterprise. So, low labor productivity can be explained by the ineffectiveness of labor using. Those employees in Industry and Trade sector get higher working hour level.

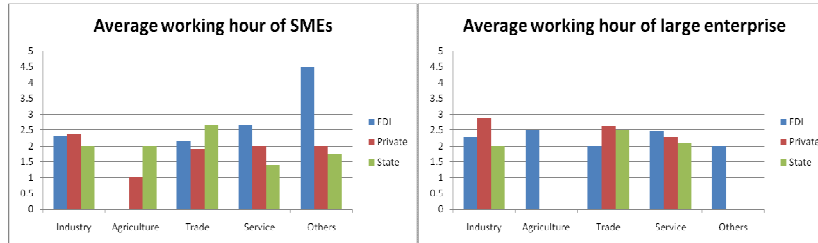


Figure 9. Working hour level of Vietnamese SMEs and large enterprises

Satisfaction of Vietnamese laborers is fairly high for both kinds of enterprise. The highest satisfaction level is in Trade sector for both kinds of enterprise.

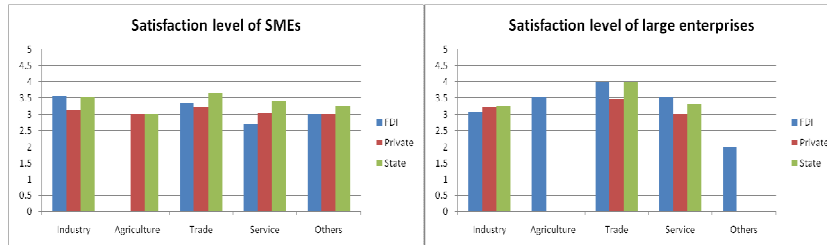


Figure 10. Employee satisfaction level of Vietnamese SMEs and large enterprises

5. Data analysis and result

(a) One way ANOVA comparison result

To test the hypothesis 1, collected data (from 287 validated responders) is divided into three groups by KM variable (KM<=2.5, 2.5<KM<4 and KM>=4) to compare the difference in ES variable (employee satisfaction) by using one-way ANOVA analysis. The result is as follows:

Table 1. Mean comparison of ES by KM flag using One-way ANOVA (Tukey HSD)

(I) KM_flag	(J) KM_flag	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0	1	-.589*	.098	.000	-.82	-.36
	2	-1.209*	.101	.000	-1.45	-.97
1	0	.589*	.098	.000	.36	.82
	2	-.620*	.072	.000	-.79	-.45
2	0	1.209*	.101	.000	.97	1.45
	1	.620*	.072	.000	.45	.79

*. The mean difference is significant at the 0.05 level.

At the significant level 0.05, the satisfaction of employees is different clearly between 3 groups of knowledge management level (0-low, 1-medium, 2-high). This proves that knowledge management activities of an enterprise determine the satisfaction of its employees. The more KM activities enterprises do, the higher their employee satisfaction will be.

(b) Correlation analysis result

Table 2. Correlation between internal capabilities, KM, satisfaction and labor productivity

Correlations		LC	CC	MC	IC	TC	KM	ES	LP
LC	Pearson Correlation	1	.616**	.607**	.447**	.363**	.617**	.480**	.204**
CC	Pearson Correlation	.616**	1	.668**	.530**	.300**	.616**	.485**	.246**
MC	Pearson Correlation	.607**	.668**	1	.529**	.339**	.604**	.467**	.194**
IC	Pearson Correlation	.447**	.530**	.529**	1	.350**	.557**	.414**	.150*
TC	Pearson Correlation	.363**	.300**	.339**	.350**	1	.522**	.537**	.362**
KM	Pearson Correlation	.617**	.616**	.604**	.557**	.522**	1	.670**	.223**
ES	Pearson Correlation	.480**	.485**	.467**	.414**	.537**	.670**	1	.457**
LP	Pearson Correlation	.204**	.246**	.194**	.150*	.362**	.223**	.457**	1

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Through this table, some correlations in the model have been proved, such as: KM has strong relationship with LC, CC, MC, IC, TC, ES; ES has relationship with LC, CC, MC, IC, TC, KM, LP; and LP has relationship with TC, ES. However, some relationships are weak and some independent variables have correlation with each other.

(c) Regression analysis result:

After running regression analysis using SPSS to test hypotheses 2, 3, and 4, the final model could be summarized as follow (numbers on arrows are factors' weights):

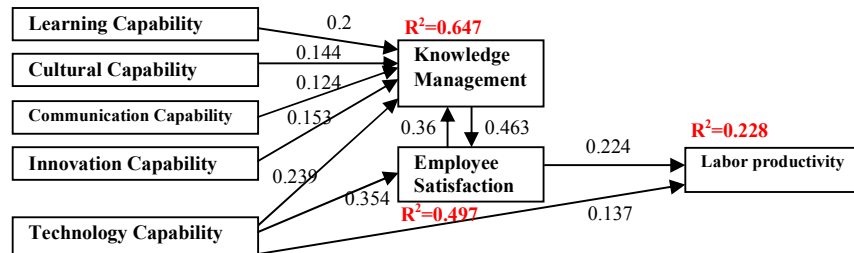


Figure 11. Relationship between Knowledge, Technology capability and Labor productivity

According to above results, hypothesis 1 and 2 are proven completely, and part of hypothesis 3 and 4 are proven. The final model is little different from the original model in figure 4, such as: Employee satisfaction is only affected by KM and Technology capability; KM doesn't have a direct effect on Labor productivity.

6. Solution for improving labor productivity

Based on above results, the most important capability affecting on KM of Vietnamese enterprises is technology capability (TC). So, applying modern technology and improving ICT maturity level will help implementing a KMS successfully. By comparison between 2 parts of TC (Techno-ware and ICT-ware), an interesting finding is that Techno-ware has more impact on Satisfaction and Labor Productivity, while ICT-ware has more impact on KM. Therefore, raising ICT maturity is very important for Vietnamese enterprises before they could apply a KM solution.

Besides, at different ICT maturity level, Vietnamese enterprises should focus on different KM aspects. At this time, with low level in ICT maturity [7], Vietnamese enterprises should focus on modernizing techno-ware to increase employee satisfaction and labor productivity. For a long term purpose, they should gradually improve ICT-ware to further increase employee satisfaction and KM effectiveness, which will ensure the sustainable development of their enterprises in the future.

From this model, labor productivity is affected mostly by employee satisfaction, which is affected mostly by KM. So that, to raise the labor productivity, Vietnamese enterprises should focus on improving the satisfaction of their employees based on KM approach. This approach will stimulate KM processes, such as: Knowledge Accumulation, Knowledge Sharing, Knowledge Utilizing and Knowledge Creating. Those processes could be executed with or without ICT support, but they will be more effective with the support of ICT infrastructure. An adaptive KM approach could be a solution, which aims at applying modern ICT gradually to maximize the effectiveness of KM processes toward increasing employee satisfaction of the enterprise.

However, there are other factors outside of this model, which also affect on the labor productivity of Vietnamese enterprises at this time. Another research [10] showed that those factors are: assessment system, organizational structure, managerial methods... Besides, from questionnaire responses of this research, those factors are also in the top suggestions for a better labor productivity of the enterprise as follow:

Table 3. Top suggestions for improving labor productivity of Vietnamese enterprises

ID	Suggestions	Count
1.	Improve assessment system	22
2.	Focus on training system	15
3.	Improve managerial method	14
4.	Improve interrelationship	10
5.	Clearly job assignment, job rearrange	9

From above results, the most reason for low labor productivity of Vietnamese enterprise is the lack of standardized assessment system, which is also the main cause for inequality in salary, and un-satisfaction of employees. In order to improve assessment system as well as other disadvantages, Vietnamese enterprises should apply modern information systems, such as: ERP, SCM, or KMS, because those information systems will help to standardize business processes and to supply more information for assessment and decision making.

Another solution for Vietnamese enterprises to solve their current problems is to apply business process modeling software (ex. ADONIS [2]), which can help managers to monitor and to optimize their business processes. It can be used as a mean to externalize their tacit knowledge in doing business, to standardize their management methods, and to turn their enterprises toward a knowledge-oriented one. Doing like this, necessary conditions for implementing a KMS successfully are established.

Besides, according to survey responses of this research, top 5 reasons of employees' un-satisfaction of Vietnamese enterprises are:

Table 4. Top reasons of employee un-satisfaction of Vietnamese enterprises

ID	Reasons	Count
1.	Work pressure	11
2.	Low salary, lack of incentive	10
3.	Ineffective management	7
4.	Strict, uncreative working environment	7
5.	Ineffective HRM policies	5

Through this table, top two un-satisfaction reasons are caused by low labor productivity of Vietnamese enterprise. Next three reasons concern about management activities. From figure 12, three most important capabilities should be improved are technology capability, learning capability, and innovation capability. Improving those capabilities will make operation become easier. As a result, work pressure will decrease and salary will increase. Moreover, high innovation capability with the support of modern ICT will accelerate a more effective management method, and finally, the satisfaction of employees and labor productivity will also increase.

In general, to improve the labor productivity of Vietnamese enterprises, there are 2 sectors to be improved: (1) Knowledge Management approach (focusing on knowledge capability and technology capability) and (2) Other managerial aspects. From analysis results with referencing comments and ideas of Vietnamese managers through some interviews, the suggestion for Vietnamese enterprises to improve their labor productivity is summarized in the following table.

Table 5. Suggestions for improving labor productivity of Vietnamese enterprises

Type	Characteristic	KM approach	Other managerial aspects
FDI	<i>KM level:</i> highest <i>Weakest:</i> cultural capability <i>Strongest:</i> technology capability	They should improve their communication and cross-cultural management through organizing many social events and frequent meetings which help to shorten the cultural gap and to increase mutual understanding between managers and employees. Periodically, reallocating employees throughout the enterprise will help sharing knowledge and exchanging culture.	The labor union should take initiatives in creating open discussions or connections with private or public companies which will provide various working environments for the employees to realize the strong points of the enterprises where they are working.
Private	<i>KM level:</i> lowest <i>Weakest:</i> technology capability <i>Strongest:</i> communication capability	They should invest more on replacing old manufacturing machines and improving their ICT infrastructure gradually. At the same time, human resource skills should be improved relatively. A complete principle for improving employee skills should be made, from: recruiting, training, and encouraging... A useful and cheap solution is to train employees self-learning skills and to encourage them to join evening classes for improving their skills.	Being a member of supply chain with other partners from FDI sectors will help to increase technology level of private enterprises. Moreover, the family-controlled style of management should be avoided as it tends to create interest groups inside the company who will hinder the employees to make the best contribution.
State owned	<i>KM level:</i> medium <i>Weakest:</i> innovation capability <i>Strongest:</i> learning capability	They should create an open culture which accepts new ideas, adopt a more flexible structure and invest more on R&D. Outsourcing some functions to privates companies will help to simplify organizational structure, to focus on core business and to increase innovation. Applying SCM, ERP or other management information systems will help creating an equal assessment system. As a result, it will stimulate communication and innovation.	Using internal social network to encourage employees to voice their opinion on any problem is another solution. Moreover, the innovation of management should also be focused. Currently, most of managers are appointed more on their experience or connection than on their real talents and capabilities.

7. Conclusion

Based on the original model of [6], this paper proposed a new model for measuring the affection of KM on labor productivity, with the contribution of knowledge capability, technology capability and employee satisfaction. By analyzing data from Vietnamese enterprises, two hypotheses confirmed completely are: (1) Knowledge management activity determines the satisfaction of employees; (2) Learning, culture, communication, innovation, technology capability, and employee satisfaction have a strong effect on knowledge management activity. Other hypotheses are partly con-

firmed and could be revised as follows: (3) Knowledge management and technology capability have positive effect on satisfaction of employees; (4) Employee satisfaction and technology capability positively affect on labor productivity of an organization.

Through this research, technology capability is realized to be an important factor affecting on knowledge management, employee satisfaction and labor productivity. In general, using technology capability as a momentum, whole KM approach could be applied to improve internal capabilities of the enterprise. Improving those capabilities will gradually turn the enterprise toward a knowledge-oriented one, which will increase the satisfaction of its employees, stabilize its workforce, and finally improve its labor productivity.

Besides, based on data analysis and interviews, some suggestions for improving labor productivity of Vietnamese enterprises are also provided. However, there are some limitations of this research, and some implications for future works could be: revising measurement variables for employee satisfaction and KM activity; exploring effectiveness of a BPMS, ex. ADONIS [2], on labor productivity; testing this model for various regions, countries with different KM levels.

Acknowledgements

Thanks to employees and managers of Vietnamese enterprises, who answered the questionnaire, or participated in the interview of this research for discussing the solution to improve the labor productivity of Vietnamese enterprises.

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Appendix - Questionnaire

STATEMENT	<i>Very disagree</i> ← → <i>Very agree</i>
Learning capability	
Your enterprise' s explicit knowledge is stored for supporting business work	1 2 3 4 5
Your enterprise has many specialists for supporting various works	1 2 3 4 5
A new problem in your company can be solved quickly with current knowledge	1 2 3 4 5
Your company encourages self learning and has an effective training system	1 2 3 4 5
Cultural capability	
Your company has an open culture, which accepts new ideas and innovation.	1 2 3 4 5
Your company has ability to review itself and see things in a different manner.	1 2 3 4 5
Your company's culture creates trust for cooperation between employees.	1 2 3 4 5
Communication capability	
Your company applies IT & modern IS for facilitating communication.	1 2 3 4 5
Idea exchange methods for creative ideas are encouraged.	1 2 3 4 5
Your company often organizes meetings for employees to share knowledge.	1 2 3 4 5
Innovation capability	
Your company has ability to make change of its management system.	1 2 3 4 5
Your company has a flexible structure, which can be changed if necessary.	1 2 3 4 5
Your company can create adapted products/services for various customers.	1 2 3 4 5
Knowledge management activity	
Your company acquires and stores knowledge in knowledge base for later use	1 2 3 4 5
Your company can share and disseminate knowledge to anyone in need.	1 2 3 4 5
Your company has ability to apply knowledge in solving business problems.	1 2 3 4 5
Your company's research activities can create new knowledge effectively.	1 2 3 4 5

1. Your company name:
2. Your company head office location:
3. Type of your company (owner of the majority capital):
 State owned company FDI company Private company
4. Your company main field of business:
 Industry Agriculture Trade Service Others
5. Your company size (number of full-time employees):
 <50 50-249 250-499 500-999 >=1000
6. Technology level of your company within your industry:
 Very low Low Medium High Very high
7. Information and communication technology (ICT) level of your company:
 Inactive Basic Substantial Web-based Knowledge-oriented
8. Your name: Male Female
9. Your department and position:
10. Your average salary/ month (USD):
 <200 200 – 499 500 – 999 1000–1999 >=2000
11. Your average working hours/ month:
 <150 150 – 199 200 – 249 250 – 299 >=300
12. Your satisfaction about working environment:
 Very unsatisfied Unsatisfied So-so Satisfied Very satisfied
13. If (very) unsatisfied, please give the reasons:
14. Suggestions for improving the labor productivity of your company: