IMPACT OF ORGANIZATIONAL CULTURE ON LABOR PRODUCTIVITY OF IT EMPLOYEES IN VIETNAM

Pham Quoc Trung[(1)], Nguyen Xuan Dien[(2)]
[(1)]Ho Chi Minh City University of Technology (VNU-HCM), Vietnam
[(2)] System Gear Vietnam Ltd. Company, Vietnam
Email: pqtrung@hcmut.edu.vn

ABSTRACT

This research is carried out to measure the impact of organizational culture on employees' labor productivity in the software companies in Vietnam. In this study, the organizational culture measurement scale is developed based on the questionnaires of Romualdas et al., and labor productivity is based on perceptual measurement. There are 97 qualified samples used for pilot study and 244 qualified samples collected for major study. In pilot study, 48 items of 12 organizational culture dimensions are reduced to 37 items. The factor analysis result in major study extracted to 8 factors as involvement and cooperation, information transmission, learning and reward, customer care, adaptability, strategic direction, agreement and concern for employees, coordination. After conducting multiple linear regression, the model of study has been indentified which could explain 14.5 % of the total variability in labor productivity and six factors positively affecting on labor productivity have been found including: strategic direction, information transmission, coordination, involvement and cooperation, agreement and concern for employees, learning and reward (descending order by significance level).Based on the study's analysis results, managerial implications and recommendations to improve labor productivity from organizational culture's viewpoint are also suggested.

KEYWORDS: *organizational culture, labor productivity, IT industry, software company, Vietnam*

1. INTRODUCTION

Today, the globalization trend leads to a stronger competition between businesses in the global market. According to national competitive indicator report of WEF (2014-2015), one of the most important factors for the development of any country is the labor productivity (Schwab, 2014).

Vietnam currently is a developing country and also an ideal destination for foreign investment because of its cheap and abundant labor force. However, recent years, Vietnam seems to lose its advantage when the minimum salary level raising higher than the labor productivity. According to a report of Amcham, minimum wage raise of Vietnam in 2013 is 17.5%, in 2014 is 15% (Amcham, 2014), while the labor productivity raise is slower, for example, in 2010 is 3.6%, in 2011 is 3.5%, and in 2012 is 2.5% (Ngọc, 2013).

In comparision with other countries in ASEAN, the labor productivity of Vietnam in 2010 is about 23.3% of Malaysia's, about 37% of Thailand's, and about 69.9% of the Philipine.

Besides, in order to achieve to goal of GDP increase 7-8% each year to 2020, Vietnam needs to raise the labor productivity more than 50% (annual raising rate must be 4.1%-6.4%). This is a challenged task (OECD, 2013).

According to ICT white book in 2014, the IT industry in Vietnam developed very fast. The total revenue of IT industry in 2013 is higher than 39 billion USD. It raised 55% compared with previous year. In which, the total revenue of software and digital content is about 2.6 billion USD (Quang, 2014).

However, the contribution of IT industry in the total revenue of the economy is still low. In general, the labor productivity of IT industry is a little bit higher than other industries in Vietnam, but is still very low in comparison with IT industry in other countries, such as: China, India, Singapore… Improving the labor productivity of IT industry is considered one of the most important solutions for improving the competitiveness and business performance of IT industry of Vietnam as well as the whole economy.

Different from other businesses, IT companies are classified into technology group with 3 main characteristics: R&D oriented, innovation and entrepreneurship, organizational culture(Grinstein & Goldman, 2006). In IT industry, human factor is very important because IT staff is considered knowledge workers. Therefore, in this special working environment,

organizational culture plays an important role in improving the labor productivity of IT businesses(Paul & Anantharaman, 2004).

Currently, most researches related to the impact of organizational culture on labor productivity are conducted for manufacturing industry (Loan & Hùng, 2009), construction industry (Kien, 2012)or healthcare service (Alvani, Moamadi, & Mirzaey, 2013). There is a lack of related research in the context of IT industry in Vietnam.

Therefore, research topic "Impact of organizational culture on labor productivity of IT employees in Vietnam" is necessary for conducting. This research explores some dimensions of the organizational culture in IT industry and their impacts on the labor productivity of Vietnamese IT companies. The results could be a base for suggesting managerial implications for improving the labor productivity and the competitiveness of IT industry in Vietnam.

The structure of this paper is organized as follows: (2) Literature review; (3) Methodology; (4) Data analysis and results; and (5) Discussions & conclusion.

2. LITERATURE REVIEW
2.1 Main concepts
- *Organizational culture*: There are many definitions of organizational culture, which comes from various fields of study, such as: ethnology, sociology, applied science, organizational behavior… According to Schein (2004), organization culture is a model of basic assumptions which is shared within group. It determines problem solving method, the external collaboration and the internal uniqueness. According to Ginevičius and Vaitkūnaite (2006), after analyzing 53 previous researches, 12 aspects of organizational culture have been identified including involvement, cooperation, information transmission, learning, customer oriented, adaptability, strategic direction, reward and incentive system, system of control, communication, agreement, coordination and integration.
- *IT industry in Vietnam*: IT industry creates hardware and software products, provides computer services, telecommunication devices and services to support all businesses of the economy. Since 2010, IT industry in Vietnam developed very fast. Till now, there are more than 1000 IT businesses, in which 200 companies from 150-200 employees (medium size), and 10 companies more than 1000 employees (very big)(Nam, 2013). However, main activity of Vietnamese software companies is coding for foreign customers, which has the lowest value in IT value chain (Nguyễn, 2013).
- *Labor productivity*: In general, labor productivity is defined by the ratio of output and input of a

manufacturing process(OECD, 2001). In IT industry, Mathew (2007) assumed that IT employees are knowledge workers and they understand well about their productivity, so that, it is suitable to use perception measurement scale for measuring the labor productivity of IT employees.

2.2 Related researches
- Tangen (2005): based on a model of Kurosawa (1991), Tangen showed that labor productivity is the main part of total factor productivity, which is the source for profit of any business (Tangen, 2005)
- Mathew J. (2007) explored the impact of organizational culture on productivity and product quality in Indian software companies. This research showed that there is a positive impact of organizational culture on the productivity of software companies in India. However, the research used qualitative method and the context of India, which could have different culture with Vietnam.
- Ginevičius R. & Vaitkūnaite V. (2006): quantitative research exploring the impact of organizational culture on business performance of IT industry in India. 12 dimensions of organizational culture of this research covered all aspects related to organizational culture of previous researches.

2.3 Research model & hypotheses
2.3.1. Research model
In the context of IT industry, labor productivity contributes the high fragment in the whole productivity of IT employees, which is the most important part of business performance. Therefore, this research aims at exploring the direct impact of organizational culture on labor productivity of IT employees. In this paper, 12 aspects of organizational culture of Ginevičius and Vaitkūnaite (2006) are reused for measuring the organizational culture of Vietnamese IT companies. The dependent variable is labor productivity, which is the perception measurement.

Organizational culture in this paper includes:
- Involvement: employees are encouraged to voice their opinions and participate in decision making process.
- Cooperation: group working, and collaboration ability between employees of different positions.
- Information transmission: the method of transferring information in the organization.
- Learning: individual self-learning ability, knowledge sharing and training programs.
- Customer oriented: focus on the improvement of product and service for satisfying customer.
- Adaptability: be able to adapt with the change of the inside and outside environment.
- Strategic direction: vision, goal, and strategy of organization.
- Reward and incentive system: salary, bonus, reward, punishment, and other payments of organization.

- Control system: forced rule or criteria that all employees have to follow.

- Communication: attitudes and behaviors between managers and employees and between employees.

- Agreement: level of agreement of resistant of employees with organizational standards or values.

- Coordination and integration: engagement, cooperation level between groups, divisions.

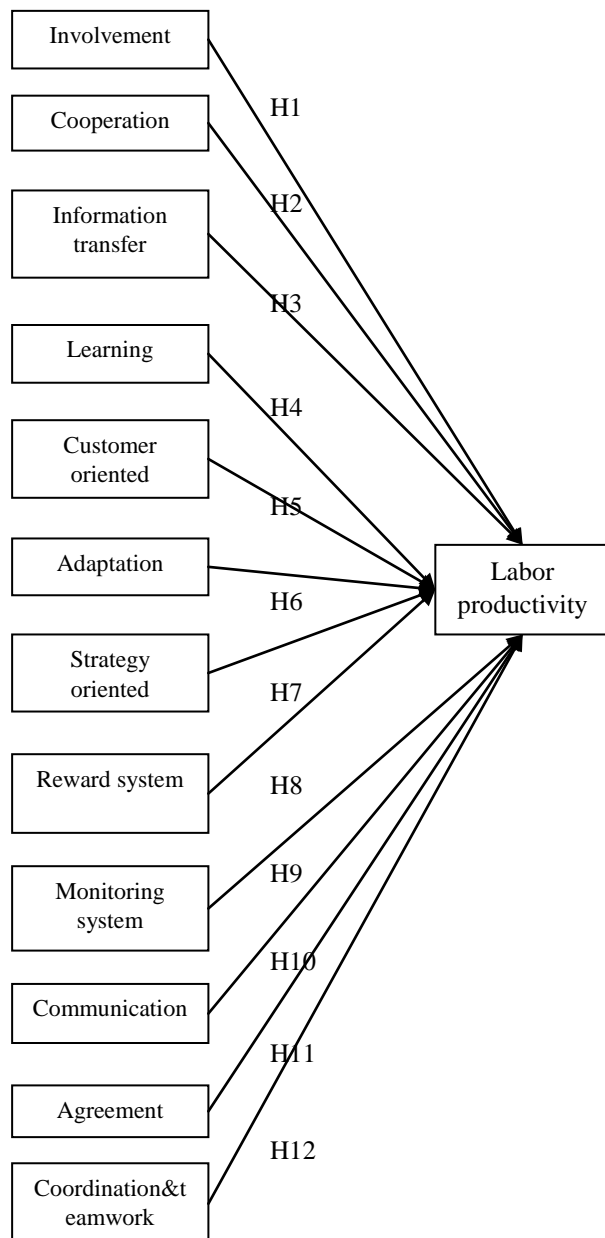The suggested research model is summarized below

Figure 2.Suggested research model

2.3.2. Hypotheses

H1: Employees' involvement has a positive impact on the labor productivity.

H2: Employees' cooperation has a positive impact on the labor productivity.

H3: Information transfer has a positive impact on the labor productivity.

H4: Employees' learning has a positive impact on the labor productivity.

H5: Customer oriented has a positive impact on the labor productivity.

H6: Employees' adaptation capability has a positive impact on the labor productivity.

H7: Strategy oriented has a positive impact on the labor productivity.

H8: Reward system has a positive impact on the labor productivity.

H9: Monitoring system has a positive impact on the labor productivity.

H10: Communication has a positive impact on the labor productivity.

H11: Employees' agreement has a positive impact on the labor productivity.

H12: Employees' coordination and teamwork has a positive impact on the labor productivity.

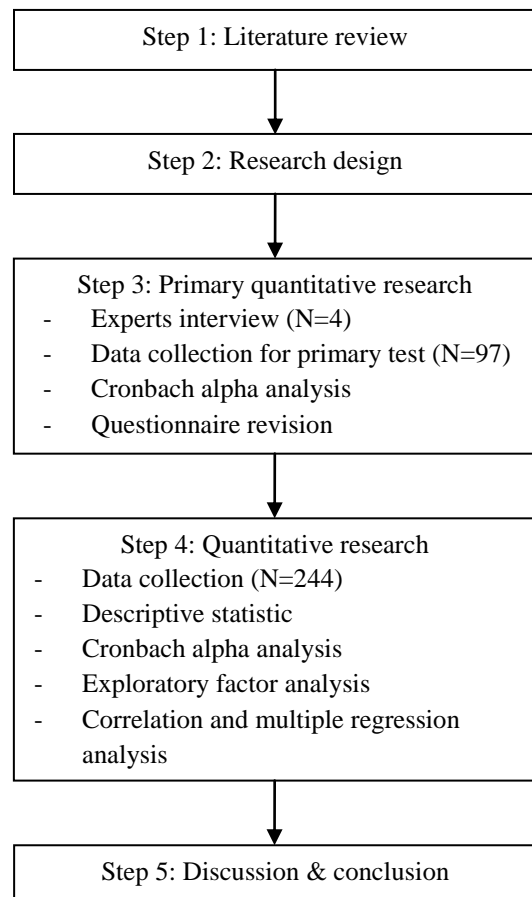## 3. METHODOLOGY
3.1. Research process

Figure3.Research process

3.2. Data sources

Data is collected from employees who are working full-time for an IT company in Vietnam. Data sampling method is convenience method. According to Hair et al. the minimum sample size must be 5 times higher than observed variables (48 questions). Therefore, necessary sample size of this research must be n >= 5*48 = 240.

3.3. Data analysis method

- Descriptive statistic
- Cronbach alpha test
- EFA test
- Multiple regression analysis

3.4. Measurement scale

Based on measurement scale of Ginevičius and Vaitkūnaite (2006), organizational culture in this paper is measured by 48 variables, grouped in 12 factors. According to Meyer et al., in this research, labor productivity is measured by 5 levels Likert scale of laborers' perception about their labor productivity. Primary analysis from 100 employees, the questionnaire is modified and used for quantitative research.

4. DATA ANALYSIS AND RESULTS

4.1. Descriptive statistic

4.1.1. Characteristics of businesses in the sample

Table 1. Descriptive statistic of businesses

Owner	Freq.	Percentage (%)
Vietnam	54	22.1
Japan	132	54.1
America	36	14.8
Others	22	9.0
Business size	**Freq.**	**Percentage (%)**
Less than 10	7	2.9
From 10 to 50	75	30.7
From 50 to 100	79	32.4
Greater than 100	83	34.0
Total	244	100.0

4.1.2. Characteristics of respondents

Table 1. Descriptive statistic of respondents

Gender	Freq.	Percentage (%)
Male	164	67.2
Female	78	32.0
Unknown	2	0.8
Total	244	100.0
Age	**Freq.**	**Percentage (%)**
≤ 25	47	19.3
26~30	125	51.2
31~35	61	25.0
> 35	9	3.7
Unknown	2	0.8

	Freq.	Percentage (%)
Total	244	100.0
Education	**Freq.**	**Percentage (%)**
Technical/ High-school	2	0.8
College	16	6.6
University	209	85.7
Post Graduate	16	6.6
Unknown	1	0.4
Total	244	100.0
Job position	**Freq.**	**Percentage (%)**
Programmer	144	59.0
Tester	18	7.4
BrSE, Senior Technical Specialist	51	20.9
Project Manager	15	6.1
Others	16	6.6
Total	244	100.0
Experience	**Freq.**	**Percentage (%)**
< 1 year	28	11.5
1 - 3 years	55	22.5
3 - 5 years	66	27.0
5 - 7 years	37	15.2
7- 9 years	34	13.9
> 9 years	20	8.2
Unknown	4	1.6
Total	244	100.0

4.1.3. Characteristics of labor productivity

Table 3. The average labor productivity of sample

Labor productivity	Freq.	Percentage (%)
Very low	6	2.4
Low	11	4.5
Average	102	41.8
High	78	32.0
Very high	47	19.2
Total	244	100.0

Besides, there is a difference in labor productivity of employees between different countries.

Table 4. The avg. labor productivity by owner

Owner	Avg. productivity	Freq.	Stdev.
Vietnam	3.70	54	1.039
Japan	3.50	132	0.937
America	3.86	36	0.833
Others	3.73	22	1.120
Total	3.62	244	0.968

4.2. Cronbach alpha analysis

Analysis results showed that all variables are reliable. However, Cooper06 has low item-total coefficient (0.215 <0.3), so it is removed from the scale. Rerun analysis, factor Cooperation satisfied requirement (alpha=0.668).

4.3. Exploratory factor analysis (EFA)

Bartlett test and KMO showed that sample is suitable for EFA (KMO = 0.887 > 0.5 and sig = 0.000 <0.05). Principle Components Analysis model and Varimax rotation method are used for this research. After removing Commun38, Rewinc32 and Commun41 (loading factor<0.5), EFA results returned 8 factors from 33 remaining observed variables.

Table5. EFA result

Variable	Factor							
	1	2	3	4	5	6	7	8
Involv01					0.754			
Involv02					0.698			
Involv03					0.547			
Cooper04					0.651			
Cooper05				0.564				
Inftra08						0.722		
Inftra09						0.770		
Inftra10						0.664		
Learni11			0.582					
Learni12			0.593					
Learni14			0.713					
Carcli15				0.669				
Carcli16				0.492				
Carcli17				0.774				
Carcli19				0.712				
Adapta21							0.822	
Adapta22							0.797	
Adapta24							0.765	
Strdir25		0.787						
Strdir26		0.784						
Strdir27		0.509						
Strdir28		0.509						
Strdir29		0.582						
Rewinc30			0.581					
Rewinc31			0.691					
Rewinc34	0.618							
Commun40	0.599							
Agreem42	0.577							
Agreem43	0.727							
Agreem45	0.657							
Cooint46								0.781
Cooint47								0.835
Cooint48	0.533							

From above result, there are 8 factors extracted at Eigenvalue = 1.110(>1), and the result explained about 64.3%the variation of data. Therefore, the model is suitable and could be used for correlation and regression analysis.

4.4. Revised model

The original model with 12 factors and 48 variables should be reduced into 8 factors and 33 variables after Cronbach alpha and EFA. There are some changes in the revised model, which could be summarized as follows:

- Factor "Involvement" and "Cooperation" are combined together, so H1 and H2 are also combined into H1_2.
- Factor "Learning" and "Reward system" are combined, so H4 and H8 are also combined into H4_8.
- Factor "Communication", "Agreement", and a part of "Coordination" are combined together with a new name "Agreement and Care", so H10 and H11 are combined into H10_11.
- Factor "Coordination and Teamwork" is renamed to "Coordination", and H12 is changed relatively.

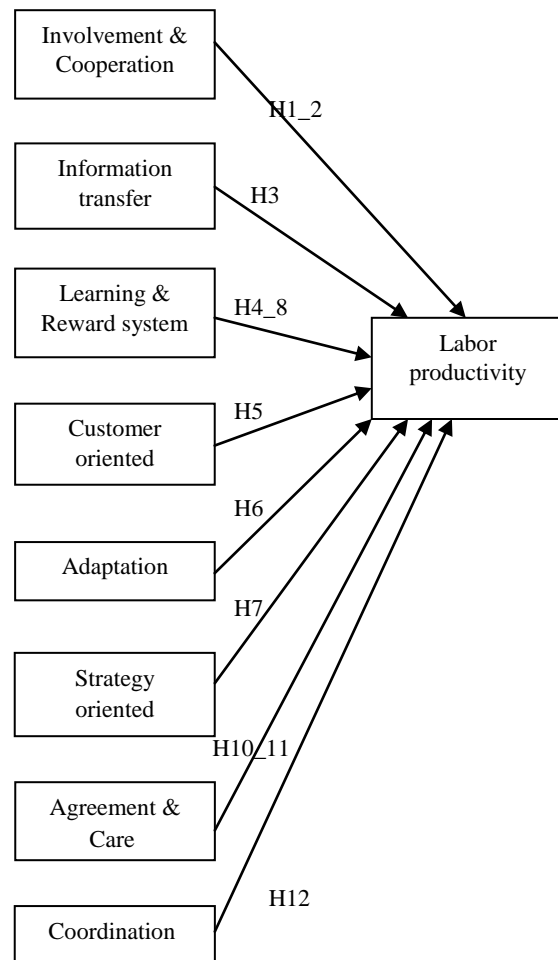The revised model is summarized in the following figure:

Figure4. Revised research model

4.5. Multiple regression analysis

From correlation analysis, only 6 factors are related to dependent variable (Adaptation & Customer oriented are removed). Therefore, 6 factors are used for regression analysis with Enter method. The Adjusted R^2 coefficient is 0.145, which means only 14.5% variation of labor productivity is explained by 6 independent variables.

The F test in ANOVA analysis with sig. = 0.000 showed that the regression model is suitable. The regression analysis result is summarized in below table.

Table 6.Regression analysis model

Model	Coefficient		Standardized coefficient	t	Sig.
	B	Std. err.	Beta		
(Constant)	4.619	.057		80.651	.000
Agreement and care	.130	.057	.134	2.267	.024
Strategy oriented	.234	.057	.242	4.078	.000
Learning & reward	.111	.057	.115	1.934	.054
Involvement & cooperation	.150	.057	.155	2.611	.010
Information transfer	.159	.057	.164	2.769	.006
Coordination	.156	.057	.161	2.712	.007

4.6. Hypotheses test

From above analysis result, the hypothesis test could be summarized as follows:

Table 7. Hypothesis test result

ID	Hypothesis	Result	Beta	Sig.
H1_2	Involvement & Collaboration => LP	Supported	0.155	99%
H3	Information transfer => LP	Supported	0.164	99%
H4_8	Learning & Reward system => LP	Supported	0.115	94%
H5	Customer oriented => LP	Rejected	-	-
H6	Adaptation => LP	Rejected	-	-
H7	Strategy oriented => LP	Supported	0.242	99.9%
H9	Monitoring system => LP	Rejected	-	-
H10_11	Agreement & communication => LP	Supported	0.134	97%
H12	Cooperation => LP	Supported	0.161	99%

5. DISCUSSION &CONCLUSIONS

5.1. Summary

Above results showed that 6 remaining factors of the revised model have positive impact on labor productivity of IT employees. The strongest impact factor is "Strategy oriented" (beta=0.242). Then, other impact factors by descending order are: Information transfer (beta=0.164), Coordination (beta=0.161), Involvement and cooperation (beta=0.155), Agreement and care (beta=0.134), and finally, Learning and reward (beta=0.115).

5.2. Managerial implications

From this result, some managerial implications for improving the labor productivity of IT employees could be suggested as follows:

Strategy oriented

This is the strongest impact factor on labor productivity. Therefore, the manager should pay attention to building organizational strategy and making the strategy visible by all employees.

Information transfer

Information is very important with IT industry. Therefore, in building organizational culture, manager of IT industry should focus on establishing a convenient data transfer method and communication mechanism within the organization. Multiple information channels could be used for sharing information, such as: e-mail, document, telephone, facsimile, website, whiteboard, Skype, Redmine, Chatwork, social networking sites…

Coordination

Manager should establish a working environment to support coordination between departments and divisions. Training course as well as team building activities could help getting this goal.

Involvement and cooperation

Project based activities of IT projects require involvement and cooperation. Therefore, individual capability and teamwork ability of IT employees are both required. An open culture should be considered for encouraging individual creativity and their participation in decision making process.

Agreement and care

This factor of organization culture helps to solve the conflicts in group works. Therefore, the manager must care for their employees and try to solve the conflict for increasing the agreement of employees to the common principles. If all employees think of their organization as a family, their working spiritual will be better and their labor productivity will be higher.

Learning and reward

Although this factor has the weakest impact on labor productivity, it could be very important in the long time

because Learning can increase the knowledge, skills and capability of IT employees, and Reward can change their attitude toward higher labor productivity. Therefore, the managers should pay attention to setting suitable KPI for measuring and providing rewards for employees based on their learning results and long-term engagement.

Other things to concern about
- An open environment for communication and conversation between employees could be useful.
- A monitoring system must be applied at a suitable level (not too strict, not too weak).
- Leadership and managers' style are also important. The managers must be leaders and motivators for employees.

5.3. Limitations & future researches
Some limitations of this research are as follows: (1) Small sample size; and (2) Perception measurement scale of labor productivity.

Therefore, implications for future research could be:
- Conduct similar research with bigger sample size and using better measurement scale for labor productivity.
- Evaluate the impact of demographic variables (size, owner…) on the labor productivity.

REFERENCES
Alvani, S. M., Moamadi, S., & Mirzaey, M. (2013). The Impact of Organizational Culture on Labor Productivity. Pajouheshgar (Journal of Management), 9(28), 25-38.

Amcham. (2014). Vietnam's 2014 Minimum Wage Adjustment shows "moderation;" 15% increase vs. 17.5% increase in 2013. truy xuất từ http://www.amchamvietnam.com/30442612/vietnams-2014-minimum-wage-adjustment-shows-moderation-15-increase-vs-17-5-increase-in-2012/

Davis, S. M. (1984). Managing corporate culture. Cambridge Ballinger.

Dwirantwi, & Addo, E. (2012). Organizational Culture and its effect on productivity; the case study of La Community Bank. University of Science and Technology.

Ginevičius, R., & Vaitkūnaite, V. (2006). Analysis of organizational culture dimensions impacting performance. Journal of Business Economics and Management, 7(4), 201-211.

Grinstein, A., & Goldman, A. (2006). Characterizing the technology firm: An exploratory study. Research Policy, 35(1), 121-143.

Hofstede, G. (1984). Culture's consequences: international difference in work related values: Sage, London and Beverly Hills.

Kelley, R. E. (1990). The Gold Collar Worker: Harnessing the Brainpower of the New Work Force: Addison-Wesley.

Kien, B. T. (2012). Factors Affecting the Fluctuation of Labor Productivity in the Construction Projects.

International School of Business, University of economics Ho Chi Minh City, Ho Chi Minh.

Loan, T. T. K., & Hùng, B. N. (2009). Nghiên cứu các yếu tố quản lý có ảnh hưởng đến năng suất của các doanh nghiệp trong ngành may. Science & Technology Development, 12(01).

Mathew, J. (2007). The relationship of organisational culture with productivity and quality: A study of Indian software organisations. Employee Relations, 29(6).

Meyer, A. N., Fritz, T., Murphy, G. C., & Zimmermann, T. (2014). Software developers' perceptions of productivity. Paper presented at the The 22nd ACM SIGSOFT International Symposium on the Foundations of Software Engineering.

Mihaela, S. O. (2013). Organizational culture - an essential factor for increasing the competitiveness of a company. "Costin C. Kiriţescu" National Institute for Economic Research.

Nam, T. H. (2013). Thực trạng phát triển ngành Công nghiệp Công nghệ thông tin Việt Nam. truy xuất từ http://tapchibcvt.gov.vn/TinBai/3293/Thuc-trang-phat-trien-nganh-Cong-nghiep-Cong-nghe-thong-tin-Viet-Nam

Nathalie Delobbe, R. R. H., Christian Vandenberghe. (2002). Measuring Core Dimensions of Organizational Culture: A Review of Research and Development of a New Instrument.

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric Theory (Vol. 3rd ed). New York: McGraw-Hill.

O'Reilly, C. A. C., Jennifer. (1986). Organization commitment and psychological attachment: The effects of compliance, indentification, internalization of prosocial behaviors. Journal of Applied Psychology.

OECD. (2001). Measuring Productivity - OECD Manual.

OECD. (2008). Labor productivity indicators. OECD

OECD. (2013). Economic Outlook for Southeast Asia, China and India 2014: Beyond the Middle-Income Trap: OECD Publishing.

Paul, A. K., & Anantharaman, R. N. (2004). Influence of HRM practices on organisational commitment: a study among software professionals in India. Human Resource Development Quarterly, 15(1).

Pekuri, A., Haapasalo, H., & Herrala, M. (2011). Productivity and Performance Management – Managerial Practices in the Construction Industry. International Journal of Performance Measurement, 1, 39-58.

Quang, D. (2014). Công bố sách trắng Công nghệ thông tin - Truyền thông 2014. truy xuất từ http://www.baohaiquan.vn/pages/doanh-thu-cong-nghiep-cntt-nam-2013-dat-tren-39-ti-usd.aspx

Recardo, R., & Jolly, J. (1997). Organizational Culture and Teams. S.A.M Advanced Management Journal.

Schein, E. H. (2004). Organizational culture and leadership (Vol. 3rd): The Jossey-Bass business & management.

Schwab, K. (2014). Global Competitiveness Report 2014-2015. World Economic Forum p. 1,

Tangen, S. (2005). Demystifying productivity and performance. International Journal of Productivity and Performance Management, 54(1/2), 34-46.

Thọ, N. Đ. (2013). Phương pháp nghiên cứu khoa học trong kinh doanh. TPHCM: NXB Lao động - Xã hội.

Trọng, H., & Ngọc, C. N. M. (2005). Phân tích dữ liệu nghiên cứu với SPSS: NXB Thống Kê.

Uddin, M. J., Luva, R. H., & Hossian, S. M. M. (2012). Impact of Organizational Culture on Employee Performance and Productivity: A Case Study of Telecommunication Sector in Bangladesh. International Journal of Business and Management, 8(2).

Užík, M., & Vokorokosová, R. (2007). Labour productivity as a factor of competitiveness - a comparative study.

Wagner, S., & Ruhe, M. (2008). A Systematic Review of Productivity Factors in Software Development. Paper presented at the 2nd International Workshop on Software Productivity Analysis and Cost Estimation (SPACE 2008), Beijing, China.

PHOTOS AND INFORMATION

	Pham Quoc Trung received the B.S. in Mathematics-Informatics (2000), M.Sc. in Computer Science (2004) from HCMC University of Natural Science, and Ph.D. in Economics (2011) from Kyoto University. He is a Professor, Department of Management Information System, School of Industrial Management, HCMUT (VNU-HCM). His current interests include MIS, e-business, business intelligence, knowledge management, decision support system…
	Nguyen Xuan Dien received the B.E. (2007) in Computer Science from HCMUT, and MBA. (2015) from HCMC University of Technology (VNU-HCM). He is an IT manager at System Gear Vietnam. His Current interests include information system development, ICT management, software quality, labor productivity...