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THE RESEARCHING OF THE INDUSTRY 4.0 AFFECTING THE EFFICIENCY OF THE LOGISTICS MANAGEMENT IN VIETNAM

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ABSTRACT: *In Vietnam, the industrial revolution 4.0 (Industry 4.0) is on the onset and will affect all socio-economic sectors, while completely transforming the current production and management system. Industry 4.0 can give the Vietnamese economy a rare opportunity to break through and Vietnam is actively preparing for this opportunity, especially the logistics management. Besides, the growth of IT poses opportunities and challenges for logistics. As internet retailing increases, the companies are accepting orders from their clientele across the borders. The competences of staff and staff skills have been found to influence the efficiency of logistics performance in different industries. It is nowadays crucial to understand the importance of logistics both in the levels of the individual firm and the total economy. The study results had 200 the managers of enterprises who interviewed and answered about 13 questions. Data collected from July 2016 to December 2017 and analyzed KMO test, Cronbach's Alpha and the result of KMO analysis which used for multiple regression analysis. Managers' responses measured through an adapted questionnaire on a 5-point Likert scale. The results showed that there were three factors, which included of factors following human resource (HR), economic environment (EE), information technology (IT) with significance level 5 percent. In addition, all of three components affecting the efficiency of the logistics management with significance level 5 percent. The research results processed from SPSS 20.0 software.*

KEYWORDS: Industry 4.0, IT, Logistics, Management, LHU

INTRODUCTION

The Industrial Revolution 4.0 is also posing many challenges for policy makers in Vietnam, including creating a favorable business environment that ensures harmony to the business model of transmission services. The system; control the transparency of information; managing e-transactions, international settlement of card transactions; quality management services, products; tax loss (corporate income tax and personal income tax) and other social issues such as labor, employment and social security.

In addition to the challenge of mastering technology, experts also say that industry 4.0 can have a major impact on the labor market with a lack of high quality human resources but the unemployment rate will increase in some sectors. The Industrial 4.0 will eliminate simple labor, especially those working in agriculture and handicrafts. This would create unemployment, social unrest. Report on the future career of the World Economic Forum in 2016 predicted, the "storm" 4.0 will cause labor demand in manufacturing - manufacturing, computing - mathematics, architecture - engineering at the decline of ASEAN.

Moreover, Vietnam is a country with many high labor-intensive sectors so the challenge is even more evident. A recent report by the International Labor Organization (ILO) predicts that robots will replace 85 percent of workers in the Vietnamese textile and garment industry

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in the next few decades. Technology 4.0 is an opportunity for the transformation of the textile and apparel industry, but there are also significant challenges in terms of investment, restructuring and labor. The choosing will depend on how each enterprise approaches the technology and identifies the potential of the enterprise itself to choose the most effective path. Facing this situation, the researchers had chosen topic **"*The researching of the Industry 4.0 affecting the efficiency of the logistics management in Vietnam*"** as a paper. This paper helps policy makers who apply them for improving policy on the management of the logistics management in Vietnam for the future.

LITERATURE REVIEW

Human resources are the people who make up the workforce of an organization, business sector, or economy. "Human capital" is sometimes used synonymously with "human resources", although human capital typically refers to a narrower view (i.e., the knowledge the individuals embody and economic growth). Likewise, other terms sometimes used include "manpower", "talent", "labor", "personnel", or simply "people".

A human-resources department (HR department) of an organization performs human resource management, overseeing various aspects of employment, such as compliance with labor law and employment standards, administration of employee benefits, and some aspects of recruitment and dismissal. Human resources are key elements that contribute to the success of a firm's performance. HRM practices are intangible resources that contribute to sustained competitive advantage by enabling the development of knowledge that is embedded in the firm's culture and history, and by virtue of this context-specificity, is largely inimitable. As a lack of logistics expertise has become a critical issue in the logistics service industry in Vietnam, making improvements in recruiting, training and retention is not only essential for factor to tackle the skill shortage problem, but also an important means to build competency internally. **(By Heneman III, Herbert; Judge, Timothy A, 2005).**

Human resource (HR): It play an important part of developing and making a company or organization at the beginning or making a success at the end, due to the labor provided by employees. Human resources are intended to show how to have better employment relations in the workforce. Also, Human resources are to bring out the best work ethic of the employees and therefore making a move to a better working environment.

Besides, the development of human resources is essential for any organization that would like to be dynamic and growth-oriented. Unlike other resources, human resources have rather unlimited potential capabilities. The potential can be used only by creating a climate that can continuously identify, bring to surface, nurture and use the capabilities of people. Human Resource Development (HRD) system aims at creating such a climate. A number of HRD techniques have been developed in recent years to perform the above task based on certain principles. This unit provides an understanding of the concept of HRD system, related mechanisms and the changing boundaries of HRD **(By Kaufman, Bruce E. 2008)**.

The economic environment consists of external factors in a business market and the broader economy that can influence a business. You can divide the economic environment into the microeconomic environment, which affects business decision making - such as individual actions of firms and consumers and the macroeconomic environment, which affects an entire economy and all of its participants. Many economic factors act as external constraints on your

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business, which means that you have little, if any, control over them. Let's take a look at both of these broad factors in more detail.

Macroeconomic influences are broad economic factors that either directly or indirectly affect the entire economy and all of its participants, including your business. These factors include such things as: Interest rates, taxes, inflation, currency exchange rates…

Microeconomic factors influence how your business will make decisions. Unlike macroeconomic factors, these factors are far less broad in scope and do not necessarily affect the entire economy as a whole. Microeconomic factors influencing a business include: Market size, demand, supply, competitors, suppliers, distribution chain, such as retail stores… **(By Krugman, Paul; Wells, Robin, 2012).**

The information technology (IT): It is the discipline whereby all of the information technology resources of a firm are managed in accordance with its needs and priorities. These resources may include tangible investments like computer hardware, software, data, networks and data center facilities, as well as the staff who are hired to maintain them.

Managing this responsibility within a company entails many of the basic management functions, like budgeting, staffing, change management, and organizing and controlling, along with other aspects that are unique to technology, like software design, network planning, tech support etc. **By JaanaAuramo, JouniKauremaa, Kari Tanskanen, (2006).**

Efficiency refers to the internal functioning of logistics and generally is considered best represented through some ratio of normal level of inputs to the real level of outputs. Specifically, it is the ratio of resources utilized against the results derived. It is considered the ability to provide the desired products/service mix at a level of coat that is capable to customer. In broader sense, it is the ability of logistics function to manage resources wisely. Thus, we adopt the definition of efficiency as the measure of how well the resources expended are utilized. **By Brian et al., (2010).**

Logistics management: It is that part of procurement management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements. Logistics management activities typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfillment, logistics network design, inventory management, supply or demand planning, and management of third party logistics services providers. To varying degrees, the logistics function also includes sourcing and procurement, production planning and scheduling, packaging and assembly, and customer service. It is involved in all levels of planning and execution strategic, operational, and tactical. Logistics management is an integrating function which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions, including marketing, sales, manufacturing, finance, and information technology **(Morris & Imrie, 2012).**

Logistics management deals with the planning and control of material flows and related information in organizations, both in the public and private sectors. Generally speaking, its mission is to get the right materials to the right place at the right time, while optimizing a given performance measure and satisfying a given set of constraints. Logistics is one of the most important activities in modern societies. It is constructed on subsystems which in turn contain a collection of interrelated components. The relationship between the subsystems and

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components takes the form of coordination and exchange of materials and information. The aim of the system is to supply customers efficiently with their required products. Each subsystem controls the size of the flow of materials through the system via storage, transportation and various stages of handling and value adding. The logistics systems do not only consist of flows of materials, components and products which are processed and distributed to customers, but also include supply chain flows of spare parts and return flows of defective and used products and packaging **(Jonsson, 2008).**

METHODS OF RESEARCH

In this research, the observations can be done while letting the observing the managers of enterprises in Vietnam. Observations can also be made in natural settings as well as in artificially created environment. After preliminary investigations, formal research is done by using quantitative methods questionnaire survey of 200 the managers of enterprises in Vietnam who related and answered nearly 13 questions. The reason tested measurement models, model and test research hypotheses.

This research has 14 steps of this research process following:

1. Choose a problem
2. Review the literature
3. Evaluate the literature
4. Be aware of all ethical issues
5. Be aware of all cultural issues
6. State the research question or hypothesis
7. Select the research approach
8. Determine how the variables are going to be measured
9. Select a sample
10. Select a data collection method
11. Collect and code the data by SPSS 20.0
12. Analyse and interpret the data
13. Write the report
14. Disseminate the report

Data collected were tested by the reliability index (excluding variables with correlation coefficients lower < 0.30 and variable coefficient Cronbach's alpha < 0.60), factor analysis explored (remove the variable low load factor < 0.50). The hypothesis was tested through multiple regression analysis with linear Enter method. Finally, regression analysis is also used

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to understand which among the independent variables are related to the dependent variable, and to explore the forms of these relationships.

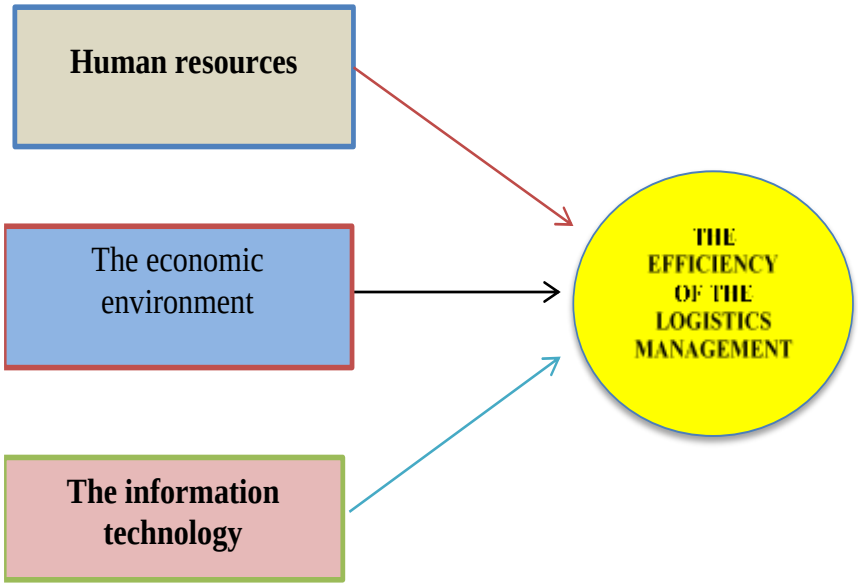

Figure 1: The Various factors have positive relation to the efficiency of the logistics management (ELM) in Vietnam.

Table 1: Hypothesis for three factors have positive relation to the efficiency of the logistics management (ELM) in Vietnam

Code	Human resources (HR)
H1	Human resources (HR) factor has positive relation to the efficiency of the logistics management (ELM) in Vietnam
H2	Economic environment (EE) factor has positive relation to the efficiency of the logistics management (ELM) in Vietnam
H3	Information technology (IT) factor has positive relation to the efficiency of the logistics management (ELM) in Vietnam

(Source: The researchers' collecting data and SPSS)

Table 1 showed that three factors have positive relation to the efficiency of the logistics management (ELM) in Vietnam.

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RESEARCH RESULTS

Table 2: Cronbach's Alpha for factors

Code	**Human resources (HR)**	**Cronbach's Alpha**
HR1	Vietnam enterprises' human resource quality is sufficient to needs for customers and our transport and distribution network that helped customers achieve cost saving	0.887
HR2	Vietnam enterprises are capable of providing customers with logistics expertise in a range of industries and widespread or extensive distribution coverage in Vietnam	
HR3	Vietnam enterprises are capable of arranging a flexible delivery schedule to fit with customer's production schedule and rapid response to customer requests	
HR4	Vietnam enterprises are capable of accommodating unique requests by implementing pre-planned solutions and innovative supply chain solutions	
CODE	**ECONOMIC ENVIRONMENT (EE)**	**Cronbach's alpha**
EE1	Vietnam Economic growth: Natural logarithm of GDP, income rising and market size developing	0.878
EE2	Vietnam Annual inflation rate: Consumer price index, bank interate and development enterprises	
EE3	Political and social environment, population change and high demand for logictics	
CODE	**INFORMATION TECHNOLOGY (IT)**	**Cronbach's alpha**
IT1	The Vietnam enterprises applied many modern technologies to meet customers for logistics management by industry 4.0 such as information quality and system quality	0.848
IT2	The Vietnam enterprises have many modern technologies to make new products/Services with high quality for user satisfaction by investing more on computer hardware and software	
IT3	The Vietnam enterprises have invested many modern technologies to improve the timeliness of delivery quality, competitive advantage and sufficiently secure to conduct business transactions	
Code	**EFFICIENCY OF LOGISTICS MANAGEMENT (ELM)**	**Cronbach's Alpha**
ELM1	Efficiency of logistics management makes Vietnam enterprises or customers cost reduction and improving competition	0.668
ELM2	Efficiency of logistics management makes Vietnam enterprises increase the quality of product/service and develop market size	
ELM3	Efficiency of logistics management makes Vietnam enterprises improve timeliness of delivery, competitive advantage and raise profit	

(Source: The researchers' collecting data and SPSS)

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Table 2 showed that all of variables surveyed Corrected Item-Total Correlation greater than 0.3 and Cronbach's Alpha if Item deleted greater than 0.6 and Cronbach's Alpha is very reliability. Such observations make it eligible for the survey variables after testing scale.

Table 3: KMO and Bartlett's Test for factors of the efficiency of logistics management (ELM) in Vietnam

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.718
Bartlett's Test of Sphericity	Approx. Chi-Square	1112.767
	df	45
	Sig.	.000

Total Variance Explained

Co.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.364	33.638	33.638	3.364	33.638	33.638	3.022
2	2.804	28.040	61.678	2.804	28.040	61.678	2.722
3	1.643	16.427	78.106	1.643	16.427	78.106	2.581
4	.518	5.185	83.290				
5	.469	4.692	87.982				
6	.341	3.410	91.392				
7	.299	2.987	94.379				
8	.275	2.751	97.130				
9	.165	1.651	98.780				
10	.122	1.220	100.000				

(Source: The researchers' collecting data and SPSS)

Table 3 showed that the results showed that KMO coefficient had: $0.5 \leq KMO \leq 1$ (KMO: Kaiser-Meyer-Olkin). KMO coefficient is 0.718 and the level of significance (Sig) is 0.000.

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Table 4: Structure Matrix for factors affecting the efficiency of logistics management (ELM) in Vietnam

Code	Component		
	1	2	3
HR3	.916		
HR2	.870		
HR4	.837		
HR1	.832		
EE1		.938	
EE2		.885	
EE3		.851	
IT2			.937
IT3			.862
IT1			.808

(Source: The researchers' collecting data and SPSS)

Table 4 showed that there are three factors affecting the efficiency of logistics management (ELM) in Vietnam. Table 4 showed that there are three factors: Human resources (X1), Economic environment (X2), Information technology (X3).

Table 5: KMO and Bartlett's Test for the efficiency of logistics management (ELM) in Vietnam (Y)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.643
Bartlett's Test of Sphericity	Approx. Chi-Square	85.284
	df	3
	Sig.	.000

Total Variance Explained

Com.	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.809	60.312	60.312	1.809	60.312	60.312
2	.682	22.724	83.035			
3	.509	16.965	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

Code	Component
	1
ELM3	.823
ELM2	.776
ELM1	.728

(Source: The researchers' collecting data and SPSS)

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Table 5 showed that the results showed that KMO coefficient had: KMO = 0.643. KMO coefficient of the higher education organizations' operation is 0.643 and the level of significance (Sig) is 0.000.

Table 6: Factors affecting the efficiency of logistics management (ELM) in Vietnam

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			To.	VIF
(Constant)	1.791	.146		12.247	.000		
X1	.265	.034	.447	7.763	.000	.992	1.00
X2	.138	.025	.333	5.472	.000	.887	1.12
X3	.121	.027	.268	4.410	.000	.890	1.12

a. Dependent Variable: Y

(Source: The researchers' collecting data and SPSS)

Table 6 showed that the smaller significance level 0.05 and the regression coefficient is positive. This means that the impact of the independent variables in the same direction with the efficiency of logistics management (ELM) in Vietnam. Besides, there is the considering magnification coefficient variance VIF (Variance Inflation Factor). VIF is exaggerated coefficient variance, when VIF value exceeding 10.0 is shown signs of multicollinearity phenomenon. While table 6 results can assert no correlation between the independent variables in the equation. Meaning no multicollinearity phenomenon by VIF values less than 10.

Table 7: Bootstrap for factors affecting the efficiency of logistics management (ELM) in Vietnam

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.634[a]	.402	.392	.41220	1.432

a. Predictors: (Constant), X3, X1, X2
b. Dependent Variable: Y
c. Predictors: (Constant), X3, X2, X1

Bootstrap for Model Summary

Model	Durbin-Watson	Bootstrap[a]			
		Bias	Std. Error	95% Confidence Interval	
				Lower	Upper
1	1.432	-.363	.108	.871	1.294

a. Unless otherwise noted, bootstrap results are based on 2000 bootstrap samples

ANOVA[a]

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Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.769	3	6.923	40.745	.000[b]
	Residual	30.923	182	.170		
	Total	51.692	185			

Bootstrap for Coefficients

Model		B	Bootstrap[a]				
			Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
1	(Constant)	1.791	.003	.137	.000	1.556	2.094
	X1	.265	-.001	.036	.000	.191	.334
	X2	.138	.000	.024	.000	.087	.184
	X3	.121	.001	.026	.000	.069	.174

a. Unless otherwise noted, bootstrap results are based on 2000 bootstrap samples

(Source: The researchers' collecting data and SPSS)

Table 7 showed that the smaller significance level 0.05 and the regression coefficient is positive. This means that the impact of the independent variables in the same direction with the efficiency of logistics management (ELM) in Vietnam. Besides, there are bootstrap results are based on 2000 bootstrap samples and bias of coefficients is zero.

CONCLUSIONS

Logistics management is an important sector in economic development, this is a new sector that at present there are very few formal universities to supply human resources for bachelor degree or logistics and supply chain management. Many enterprises in Vietnam are very lack of human resources for logistics, even crisis demand for human resources in the logistics services and supply chain management for many reasons. Firstly, these two sectors are involved in many aspects of production and service provision. Secondly, human resources with formal qualifications in this field in Vietnam are not many, most enterprises have to use personnel in close branches or retraining leading to low productivity. In addition, the study results showed that there were 200 managers of enterprises in Vietnam who interviewed and answered about 13 questions but 186 managers processed, lack of 14 samples. The paper had been analyzed KMO test, Cronbach's Alpha and the result of KMO analysis which used for multiple regression analysis. The results showed that there were three factors, which included of factors following human resources (X1), economic environment (X2), information technology (X3) with significance level 5 percent. In addition, all of three components affecting the efficiency of the logistics management in Vietnam with significance level 5 percent. The study found that the HR is a major determinant of the efficiency of logistics management in logistic firms. It is necessary to have staff with sufficient skills to ensure efficient logistics management of a company, professional qualification of logistics staffs affects efficiency of logistics management in a company and the level of education of logistics staffs. The study further found that EE factor affects the efficiency of logistics management

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and finally, the study found that information technology affects the efficiency of logistics management. According to the results, IT is a determinant of the efficiency of the logistics management. It was clear from the study that IT ensures future viability for the firm and its position in value chain and information technology has greatly increased the ability of logistic firms to conduct their business faster and more accurate over a wide range of time at reduced cost with the ability to customize. Moreover, IT also promotes and facilitates more frequent communication, interaction and information sharing between a supplier and a buyer and that information technology helps managers in redesigning their business strategy to add more value to resources. The research results processed from SPSS 20.0 software. The researchers will support policies to improve the logistics management in Vietnam in the next research.

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