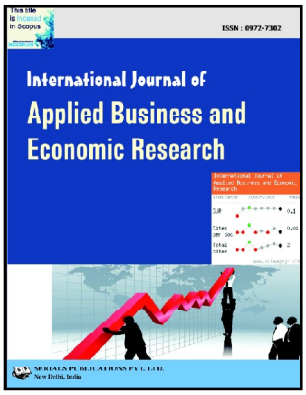

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Applying TAM Theory to Examine the Willingness to Use the IT in Logistic Service Industry

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Abstract: The goal of this paper is to study the Willingness to Use the IT in Logistic Industry by applying the TAM model. There were 176 questionnaires valid questionnaire have been put into analysis system of SPSS. The result indicates that there are 02 factors are not significance affected on Willingness to Use the IT with P-value> 0.05 including Perceived Ease; and Cost. The four remaining factors have impacted Willingness to Use the IT: Perceived usefulness (beta = .375), risk awareness (beta = .261), subjective norms (beta = .259) and perceived behavioral control (beta = .221). The conclusion, recommendation, limitation and future research suggestion also discussed in this study.

Keywords: Technology acceptance model (TAM), Information technology (IT), Willingness to Use, in Logistic Service Industry

1. INTRODUCTION

The concept of IT represents the next step towards the digitization of our society and economy (Rose, 2015). Services development based on information technology - electric from in banking industry is the inevitable trend, objectively in "era of international economic integration". The benefits of modern logistics includes a lot of characteristics, such as systematic industry, combination of logistics and information technology, technology modernization, integration of supply, integration services, a full service and network architecture of logistics system (Trappey, Trappey, Hou and Chen, 2004)). In order to improve the competitiveness of logistics service provision, enterprises must innovate their leadership style towards customers, develop high quality human resources and improve technology. news plays a very important role (Chapman, Soosay and Kandampully, 2002). Factors related to the competitiveness of logistics services in the context of integration, including the scope of supply, can carry out many logistics activities through the application of technological innovation; timely delivery to meet customer requirements and the cost-

effectiveness of large-scale cargo transport as well as the length of cargo storage; The ability to develop new services that meet customer requirements.

Currently, one of the reasons for the limited quality of logistics services and the high cost of logistics services is the application of information technology of logistics service providers in Vietnam. Logistics activities do not meet the requirements of customers in daily work.

According to information of the Asian Institute of Technology at a conference in Ho Chi Minh City. In Hai Phong, currently only 10% of enterprises use ERP technology (Enterprise Resource Tracking), 17% use EDI. 17% use TMS (Transport System Administration), 17% use Barcodes / WMS (Install Barcode System / Warehouse Management Software), 17% use GPS) (Global Positioning System). In the recent survey of the Vietnam Logistics Association (VLA,2016) for the development of the National Logistics Action Program, similar results were obtained for the application of information technology by enterprises. provide logistics services of Vietnam.

There are many reason for this stuation, first of all enterprises are not fully aware of the impact of information technology in the competitive environment. The majority of the 1,300 logistics service providers in Vietnam are small and medium enterprises. Therefore, enterprises are limited in production scale, financial resources are not plentiful while investment in information technology requires high cost, low level of corporate governance, human resource use public. Information technology is thin and lack of technology skills, investment capital for developing information technology is too small while there are many kinds of technology that can be applied to logistics activities, it is necessary to find suitable technology solutions. level and scope of business. So The goal of this paper is to study the intention behavior of logistic companies in applying the IT by applying the TAM model

2. LITERATURE REVIEW

Predicting human behavior is the fundamental objective of the theories in the field of social psychology study. Many theories have been formed to serve this goal, including the theory of rational action. Rational theory of action (Ajzen & Fishbein, 1980) along with its expansion theory as the theoretical behavior plans are theoretically be used in many previous studies and appreciated the usefulness in predicting the different behavior of humans (Madden *et al,* 1992). These theories are applicable in many research areas such as understanding the behavior ethical or unethical (eg behavioral studies gambling, gaming, ...), the study of human behavior people at work (for example, job satisfaction, ...), behavior of customers in marketing (for example, the reaction of customers with coupons, online shopping behavior, ...) and learn behaviors related to information technology (eg, ecommerce acceptable behavior).

Technology acceptance model (TAM) by Davis first proposed in 1986. The model theory origin TRA (Ajzen & Fishbein, 1980) and theoretical TPB (Ajzen, 1991). TAM launched to explain the behavior acceptable use of information technology system.

TAM model has created the foundation for a lot of theoretical research on information systems. TAM models that 'perception of usefulness' (PU) and 'perception of ease of use' perception of ease of use are the variables affecting technology acceptance (Teoh & Cyril, 2008). PU refers to the user's perception of the degree to which the system will improve the results of their work; perception of ease of use referring to comments of users on the level of effort required to use the system.

Perceived as useful or convenience is an extent of people believe that using such a system, a specific product will enhance the implementation of their own work (Davis, 1993). Some studies have shown that one of the factors affecting the decision to use the IT in service industry

H1: There is a positive relationship between Perceived usefulness and Willingness to apply IT in Logistic Industry

Ease to use is the "degree to which a person believes that the system can be used without special effort." (Davis, 1993). Ease to use factor, or also known as the friendly technology for users is one of the main factors to be considered in the technology acceptance model (Fitzsimmons. Fitzsimmons and Bordoloi, 2008).

H2: There is a positive relationship between Perceived Ease to use and Willingness to apply IT in Logistic Industry

Risk awareness is the role of cognition of risk has been studied extensively in business. When asked about the impediments of using IT, leaders of enterprises shared about other factors that they are afraid of, including other prominent factors such as new systems difficult to adapt with the old system, change too much, security information is not guaranteed ...

H2: There is a positive relationship between Risk awareness and Willingness to apply IT in Logistic Industry

Reduce the manage the cost is another motive, very powerful in promoting the leaders of enterprises choose IT as tools. One of the costs that can be reduced when IT applications are successfully deployed is personnel costs. The automation that IT delivers will help businesses reduce staffing, logistics, administration, and staffing for direct production.

H4: There is a positive relationship between low cost Willingness to apply IT in Logistic Industry

Empirically, there is many evidences that the subjective norms and perceived behavioral control have an impact on behavior of intention in using the IT First, let's look at the most popular motivational groups that make a business decide to adopt IT. The motive most often mentioned is to meet customer service needs. This is the beginning and the end: everything that the business do is directed to the customer. In the logistics industry, as the supply chain and its efficiency directly and profoundly affect the efficiency of enterprises, more than ever, the demand of customers on the level of response of enterprises Logistics service delivery is very high, and very legitimate. Therefore, the following hypotheses are proposed:

H5: There is a positive relationship between subjective norms and Willingness to apply IT in Logistic Industry

H6: There is a positive relationship between perceived behavioral control and Willingness to apply IT in Logistic Industry

The figure 1 shows the research framework.

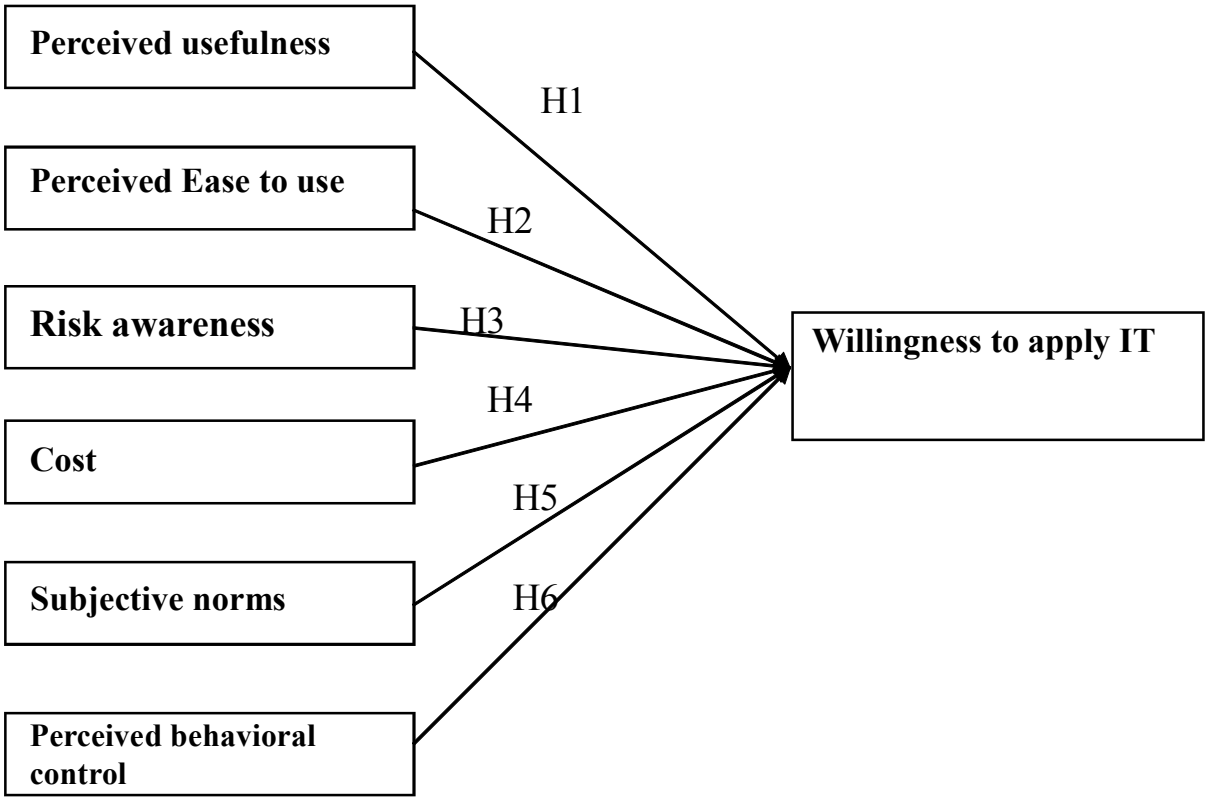

Figure 1: Research framework

3. METHODOLOGY

The questionnaires are based on the study of TAM model in several countries around the world such studies. especially studies in Thailand, Korea, Malaysia, because there have conditions like Vietnam on geographically and culturally. Also, after reviewing several studies in Vietnam, researchers have come up with the factors that influence the intention to use the IT in logistic industry based on the scale of David *et al.,* (1989).

According to the experience of many previous studies, to perform discovery factor analysis EFA effectively, the number of samples need to select a minimum of 5 times the total number of variables. Based on the total variation of the official questionnaire will select the sample size is greater than 5 times the number of variables to implement direct customer surveys. Specifically, questionnaire has about 27 items so the minimum required number of samples is 140 samples. The more the number of samples collected, the information is useful as it emits 200 select the questionnaire based on the conditions of time and the ability to reach my customers during practice at department customer service bank branches.

There were 300 questionnaires that were sent to logistic company's manager who are working in logistic industry in the northern of Vietnam, 225 questionnaires returned in which 176 questionnaires is valid questionnaire (78.2 rate of the sample size).

Multiple regression is applied to test the hypothesis study after the Reliability and Variables correlation analysis.

4. DATA ANALYSIS

4.1. Respondent profile

The result shows that, there are 37.7% manager in this study is male and female is 62.5%. Related to age of respondent, the result shows the age from 20-35-year-old is 18%, from 36-45-year-old is 34.7%, from 46 – 55-year-old is 30.7% and customer who is over 55-year-old reach 16.5% in this study.

This study also conduct the survey related to respondent's experience, from the result show that the manager who has under 5 years' experience is 10.8%, from 6-10 years is 29.5, from 11-20 years. is 33.0 % and manager who have the experience of over 20 years reach 26.7 % in this study, indicate high experience of respondent in this study.

4.2. Reliability Analysis

According to Nunnally and Bernstein (1994), the scale research should be a preliminary assessment by Cronbach's alpha coefficient. Cronbach's alpha coefficient of variation value in the range [0-1]. Cronbach's alpha coefficient as high as possible, however if Cronbach's alpha coefficient is too large (> 0.95) showed more variation in scale no different from each other. Scale reliability Cronbach's Alpha well as variability in the range of 0.70 to 0.80. If Cronbach's Alpha is > = 0.60 is acceptable scale in terms of reliability. The variables used Cronbach's alpha measure correlation coefficient of total variable> = 0.30 is satisfactory, if a variable has a correlation coefficient of total variation <0.30, the variable measuring unsatisfactory.

In the analysis result shows that 3 item is not meet the require of reliability with the Cronbach's Alpha is > = 0.60 and must remove from the analysis system include (RA1: Using IT is safer than before, PBC4: using IT help customer to avoid being obsolete and WIT3: I will use the IT in my company service.)

Table 1
Cronbach's Alpha result

Variable	*Number*	*Cronbach's Alpha*
Perceived usefulness	4	.880
Perceived Ease to use	4	.781
Risk awareness	3	.828
Cost	4	.719
Subjective norms	3	.817
Perceived behavioral control	3	.788
Willingness to apply IT	3	.821

4.3. Variables correlation

Pearson correlation analysis to determine the linear relationship between the dependent variable and the independent variables before conducting regression analysis. Correlation analysis was performed between the dependent variable is Willingness to apply IT and the independent variables are: Perceived usefulness, Perceived Ease to use, Risk awareness, Cost, Subjective norms and Perceived behavioral control Correlation analysis results presented in Table 4.6.

Table 2
Variable correlation

	PU	*PE*	*RA*	*COST*	*SN*	*PBC*	*IB*
PU	1						
PE	.055	1					
RA	.295**	-.010	1				
COST	-.019	.468**	-.037	1			
SN	.456**	.057	.356**	-.068	1		
PBC	.279**	.111	.088	.054	.293**	1	
WIT	.634**	.058	.485**	-.068	.593**	.424**	1

**. P< 0.01

4.4. Regression

For testing the hypothesis H1-H6, this study uses the multiple regression analysis. Regression analysis will determine the linear regression equation, with the beta found to confirm a causal relationship among the dependent variable: Willingness to apply IT and the independent variables are: Perceived usefulness (PU) Perceived Ease (PE) risk awareness (RA), cost (COST), subjective norms (SN) and perceived behavioral control (PBC) . Analyzed using multiple linear regression of SPSS 22.0 software with the method put into a turn (Enter). Assumptions and factors influencing the cost of the service unit in apartment buildings with linear correlation, regression equation for theoretical models as follows:

$$IB = \beta_0 + \beta_1 PU + \beta_2 PE + \beta_3 RA + \beta_4 COST + \beta_5 SN + \beta_6 PBC + \epsilon$$

The analytical results show that models the correlation coefficient $R^2 = .617$ and R^2 adjusted is .603. The index is to ensure safety in the assessment of the suitability model (not to exaggerate the relevance of the model). With adjusted $R^2 = .603 > 0.3$, the model is considered suitable by 60.3%, it means 60.3% of intention behavior to WIT is explained by the independent variables.

ANOVA analysis showed that F =45.386 is significant at 0.000 level, suggesting that building the regression model is consistent with the data collected and the factors are statistically significant at the 5% significance. Thus, the factors for the independent variable in the model with factors related to the dependent variable.

From the table 3 shows total 4 factors that affect the Willingness to apply IT are included in the regression model, deeming that there are 02 factors are not significance affected on Willingness to apply IT with P- value> 0.05 (Perceived Ease (PE) and cost (COST). The four remaining factors have impacted on Willingness to apply IT: Perceived usefulness (beta = .375), risk awareness (beta = .261), subjective norms (beta = .259) and perceived behavioral control (beta = .221)

$$IB = -.112 + .375PU + .028PE + .261\ RA - .058COST + 259SN + .221PBC + \epsilon$$

The degree in order of impacted level from high to low as follows: 1) Perceived usefulness (beta = .375), 2) risk awareness (beta = .261). 3) subjective norms (beta = .259), 4) perceived behavioral control (beta = .221) and This means, in the context of other factors constant, then when factors of Perceived usefulness improved by 1 unit, the Willingness to apply IT level will increase 0.375 units; the factor risk

Table 3
Multiple variable result

Model		*Unstandardized Coefficients*		*Standardized Coefficients*		
		B	*Std. Error*	*Beta*	*t*	*Sig.*
1	(Constant)	-.112	.363		-.308	.758
	PU	.296	.043	.375	6.808	.000
	PE	.038	.075	.028	.508	.612
	RA	.188	.037	.261	5.055	.000
	COST	-.073	.068	-.058	-1.072	.285
	SN	.287	.063	.259	4.557	.000
	PBC	.230	.053	.221	4.342	.000
	R^2/ Adjusted R^2			617/603		
	F/Sig.			45.386/0.00		

a. Dependent Variable: IB

awareness improved by 1 unit, the Willingness to apply IT level will increase 0.261 units, when factor perceived behavioral control improved by 1 unit, the Willingness to apply IT of customer level will increase 0.221 units and when subjective norms improved by 1 unit, the Willingness to apply IT level will increase 0.259 units. So this study indicates that hypothesis H1; H3, H5 and H6 are supported by the model while H2 and H4 are not supported.

5. CONCLUSION

This research is aim to study Willingness to apply IT in logistic industry by using the TAM model. This study has conduct the survey with logistic industry managers, there are 176 valid questionnaires that is imputed in the model. The result indicates that there are 02 factors are not significance affected on on Willingness to apply IT with P- value> 0.05 (Perceived Ease and cost). The four remaining factors have impacted on Willingness to apply IT : Perceived usefulness (beta = .375), risk awareness (beta = .261), subjective norms (beta = .259) and perceived behavioral control (beta = .221). This result is consistent with the Yuqiang, (2010) survey found that IT is a network connecting anything with the Internet to exchange information and communication, to realize intelligent searching source, identify cation, location, tracking, monitoring and management. In the study show that building solution where enterprises can connect all devices across a distributed network, capture and share their mission-critical data, allowing them to show real- time view of all operations. It looks like as emergency response specific, but there is a room for wide range of logistics management applications based on IT applications and systems (Xu . Yang and Yang, 2013).

The formal formation of the AEC Community in 2015 has opened many opportunities for the logistics sector in Vietnam but also presents enormous challenges. Vietnam logistics companies need to be strong against competitors in the region that have outstanding competitive advantages in terms of financial capacity, infrastructure, technology, human resources and especially modern IT. Therefore, the application

of appropriate and effective IT is not only a problem of logistics companies but also the responsibility of the management agencies to develop appropriate policies to motivate and promote IT. In the field of logistics development sustainable.

This study has two implications: academic implication and managerial implication. Base on the TAM model, this study has added the knowledge of Willingness to apply IT in logistic service industry since there are lack of research in this area in Vietnam. Also, this study with the results will make logistic manager in decision making to give the solutions to improve IT application

Although this study has the implication, there are some limitation must discussion in this study. This study is use the TAM model; however, the scale is translating from the English and it may have some limitation. Beside the sample size is just reasonable and it is conducted survey in northern of Vietnam. The bigger sample size and with other areas should be conduct for next research.

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