IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

USING TAM THEORY ON DIGITAL LOGISTICS ADOPTION IN RETAIL INDUSTRY IN VIETNAM

1Nguyen Thi Khanh Chi, 2Do Huong Giang

1Chi, 2Giang

1Foreign Trade University,

2Foreign Trade University

Abstract:

As the development of information technology, the study on applying ICTs on logistics has been necesary, especially in retail industry. However, research examining the digital logistics in retail industry in Vietnam has been little attention. Therefore, to bridge this gap the current paper investigates the relationship among ease of use, perceived usefullness, perceived trust and applying digital logistics, and also examines the moderating role of perceived risk on these relationships in the context of Vietnam. The results show that perceived trust has the largest impact on digital logistics success while perceived usefullness has least impact. The paper also highlights the role of perceived risk in decreasing the relations between applying information technology on logisctis.

Keyword: Logistics, Retail industry, E-commerce application, Vietnam

1. Introduction

Information and communication technologies (ICTs), and particularly the wide application of the Internet, has changed many traditional business models and practices. From a business perspective, the Internet can ease information exchange, improve performance throughout the entire value chain for most companies and industries [1]. Moreover, ICT is considered the most cost-efficient tool to help companies acquire bigger markets and obtain competitiveness against large companies in this globalized world [2].

In modern economic conditions, the digitalization of the various Vietnamese economy sectors, in particular, the transport and logistics sector, is receiving increased attention. Representatives of academia, government agencies, and the business community are involved in developing ways to increase the efficiency of digital transformation. At the same time, efforts should be aimed first of all at creating conditions for the development of a knowledge society, improving well-being and living standards, availability, quality of goods and services produced in the digital economy. However, it should be recognized that so far in the context of the digitalization of the Vietnamese economy and its transport and logistics sector there are some debatable issues and unresolved problems. In particular, experts somewhat differ in their assessment of the component of digitalization in the overall structure of GDP. Also, it requires a deeper study of the methodology and mechanisms for digitalization, as well as a platform concept for the transport and logistics services suppliers and consumers integration.

In a market economy, logistics in retail industry is the connection and cooperation, therefore, it plays an increasingly important role and is an indispensable factor in the production, distribution and circulation of goods, especially in creating beneficial business environment to improve the efficiency of production and business activities in all fields. Vietnam has many favorable conditions to develop the logistics industry thanks to its geography. Vietnam is located in a strategic position of the region, long stretching coast, which have many sea ports, international airports, road systems, transnational railways, economic corridors. Vietnam also has many opportunities to access the latest scientific and technological achievements, advanced management methods of the world, and logistics activities in Vietnam have been paid more attention by the management at central, local level and businesses. However, enterprises specializing in providing logistics services only meet part of the needs of the domestic market, have not yet reached the regional and international markets.

2. Literature review

2.1 The TAM model

TAM has been shown to be a theoretical model that helps explain and predict user behavior. Currently, it is largely used for predicting users intention to accept new technologies in several sectors, such as for information technologies [3], with emphasis in participation to online communities, for learning, for shopping. TAM is based on the theory of reasoned action [4] with the aim to investigate computer usage behaviour, by mainly focusing on the constructs of perceived ease of use and perceived usefulness, and on the subsequent acceptance of technology in terms of attitude towards the technology, intention to use and effective use [5]. The TAM model also suggests that ease of use describe the characteristics of sites (i.e. social network), because easy-to-use technologies may be more useful [6]. The TAM model has strong implications for technology application from a theoretical and conceptual point of view. Therefore, the factors like ease of use, perceived usefulness, perceived trust and risk in the TAM model will explain how do retail firms in Vietnam implement electronic elogistics platfom. In this research, TAM is employed to explaining the impact using e-logistics in retail industry.

2.2 Logistics

Operating within such value networks, logistics increase the value of products for customers in three generic ways: efficiency, effectiveness, and relevance . Efficiency refers to an organization's management of costs—efficient organizations offer services at costs that are acceptable to customers [7]. Effective logistics require the successful positioning of products and services. Customers who enjoy effective logistical operations are presented with a variety of purchase opportunities that are conveniently available. Short fulfillment times for orders, in-stock availability of products, and high-quality retail service are all examples of ways that logistics can be effective. Finally, in contrast to overall costs (efficiency) and the positioning of products (effectiveness), relevant logistics (sometimes called differentiated logistics) are distribution services that are designed around the ways customers work and live. Organizations using relevant logistics solicit information about specific customer needs and then develop solutions based on those identified needs. For example, when an integrated service provider customizes a mass mailing to meet a customer's specific scheduling requirements, when a manufacturer integrates a particular array of electronic features into a product in order to achieve the functionality a customer requires, or even when a particular fabric is selected for an article of clothing so that it will be fashionable, the logistics involved create value because the service rendered is relevant to customers. It is necessary to develop ongoing relationships with customers to address their needs and requirements

2.3 Hypotheses

H1: Ease of use of digital logistics adoption has positively impact on digital logistics success

H2: Perceived usefulness of digital logistics adoption has positively impact on digital logistics success

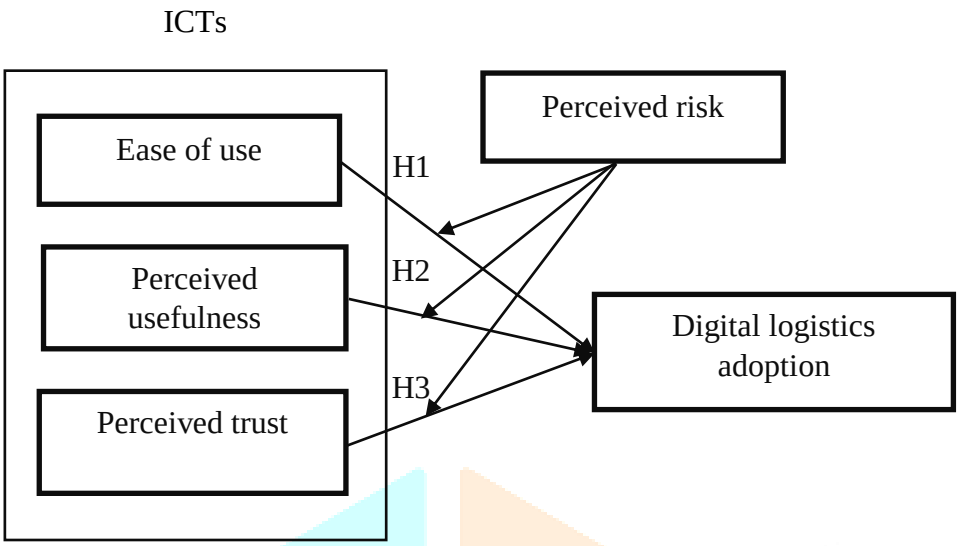
H3: Perceived trust of digital logistics adoption has positively impact on digital logistics success

H4a: Perceived risk negatively moderates the relationship between ease of use and digital logistics success

H4b: Perceived risk negatively moderates the relationship between perceived usefulness and digital logistics success

H4c: Perceived risk negatively moderates the relationship between perceived trust and digital logistics success.

In conclusion, the framework is proposed following:



3. Methodology

3.1 Measurement scale

There are 31 items on the questionnaire, including 28 items from on ease of use, perceived usefulness, WOM, perceived trust, perceived risk and digital logistics which were mesured with five-points Likerts' scale from 1 (strongly disagree) to 5 (strongly agree), and three items participant profile including gender, age, education. Perceived usefulness has five items adapted from Wu et al. (2011) [8]. Ease of use has five items from Wu et al. (2011) [8]. Perceived trust was measured by four items from the work of Blank et al. (1999) [9]. Perceived risk included five items which adapted from Bauer (1960) [10]. Digital logistic success was measured by four items adapted from Nguyen et al. (2021) [11].

3.2 Sample

According to Tabachnick and Fidell (1996) [12], the minimum sample size to achieve is calculated by the formula n = 50 + 8 * m (m is the number of independent variables) when conducting multivariate regression analysis. In this study, there are 5 variables, the minimum sample size is 90 observed samples. Sample size for the study is determined at 100 observations.

The sample consists of people who have used social network and have experienced ecological destinations. Their experiences on using social network would be more influenced on their perception of nature-based sites. 250 surveys were launched at suppermarkets in Hanoi and Quangninh cities. Participants were kindly invited to fill the anonymous form of questionnaire within two months from November to December 2019. A total of 211 responses were returned which lead to response rate at 84,4%.

The male and female participants are similar in number (50,1% and 49,8% respectively). The largest age group was under 25 years of age (58.2%). Most participants represented a university degree (73,5%) while a secondary school qualification was at 22.3% and postgraduate degree was at 4,2%.

4. Results

4.1 Reliability and hypothesis testing

Using the Cronbach' Alpha coefficient to measure the reliability of five constructs with 28 observed variables, the Cronbach 'Alpha values of PE, PU, PT, PR and DL are 0.825, 0.876, 0.898, 0.815, 0.895 and 0.833 respectively, and the Corrected items (Total Correlation coefficient) of 28 observed variables are higher than 0.3. It can be concluded that there are 28 good reliability variables from 6 constructs because only variables

with a Corrected Item (Total Correlation) greater than 0.3 and having Alpha coefficients greater than 0.6 will be accepted for analysis in the next steps.

Table 3: Cronbach's Alpha analysis

Variable	Corrected item - Total Correlation	Cronbach's Alpha if item deleted	Cronbach's Alpha value
PE			
PE 1	0.679	0.859	0.825
PE 2	0.791	0.831	
PE 3	0.738	0.843	
PE 4	0.706	0.851	
PE5	0.659	0780	
PU			
PU*1*	0.352	0.784	0.876
PU *2*	0.633	0.620	
PU *3*	0.663	0.607	
PU *4*	0.511	0.691	
PU5	0.660	0.860	
PT			
PT1	0.630	0.751	0.815
PT2	0.602	0.764	
PT3	0.636	0.748	
PT4	0.630	0.751	
PR			
PR1	0.673	0.831	0.895
PR2	0.656	0.835	
PR3	0.665	0.833	
PR4	0.706	0.822	
PR5	0.678	0.829	
DL			
DL1	0.652	0.779	0.833
DL2	0.745	0.735	
DL3	0.639	0.781	
DL4	0.570	0.811	

Source: Analysis from author

The EFA will evaluate two important values of the scale as convergence value and discriminant value. The results show that KMO and Bartlett's test of 24 elements of the five constructs shows high KMO (0.910) with significance level of 0 (sig = 0.000). Thus, KMO is greater than 0.5 indicating that the application of exploratory factor analysis method in the scale is appropriate.

Table 4: KMO and Bartlett's test of the second analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.910
Bartlett's Test of Sphericity	Approx. Chi-Square	3235.721
	Df	161
	Sig.	.000

Source: Analysis from author

The research has a rotating matrix table that eliminates unimportant loading factors to see the convergence factor in Table 5. It is shown that all the attributes of each factors are loaded in the corresponding component. And the five components can explain 65.129% the variance of all the variables from the total variance explained.

Table 5. The second run of Rotated Component Matrix

NO		Component				
	Variables	**1**	**2**	**3**	**4**	**5**
1	PU1	0.612				
2	PU2	0.734				
3	PU3	0.751				
4	PU4	0.727				
5	PU5	0.787				
11	PE1		0.690			
12	PE2		0.755			
13	PE3		0.675			
14	PE4		0.772			
15	PE5		0.795			
16	EX1			0.790		
17	EX 2			0.823		
18	EX 3			0.715		
19	EX 4			0.576		
20	PR1				0.811	
21	PR2				0.791	
22	PR3				0.786	
23	PR4				0.771	
24	PR5				0.770	

Source: Analysis from author

Regression analysis is an important step to identify how the independent factors affect dependent factor. The regression model is used to describe this relationship using the method Enter. After analyzing Pearson correlation, there are 4 independent factors (PU, PE, PT) having correlation with dependent factor (TT).

Table 7: Model summary

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R**	**Std. Error of the**
1	.742[a]	.546	.541	.551

a. Predictors: (Constant), PU, PE, EX

b. Dependent Variable: DL

Source: Analysis from authors

From the model summary table above, coefficient of linear correlation R-square is at 0.546. The value of R-square shows that the independent variables in the model explain 54.6% of the variance of the dependent variable.

Table 8 - ANOVA

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	34.617	4	8.654	24.802	.000[b]
	Residual	81.999	235	.349		
	Total	116.616	239			

Source: Analysis from authors

In ANOVA table, the sig. Value is less than 0.01, this suggests that the independent variables in the model partly explain the variability of digital logistics toward ecotourism (TT).

Table 9: Customer satisfaction regression analysis - Coefficients

Model	Unstandardized B	Std. Error	Standardized Beta	T	Sig.	Collinearity Tolerance	VIF
(Constant)	0.072	0.213		0.335	0.738		
PU	0.341	0.052	0.331	6.408	0.000	0.534	1.770
PE	0.148	0.060	0.124	2.425	0.015	0.554	1.701
PT	0.354	0.054	0.321	6.440	0.000	0.574	1.640

Source: Analysis from authors

In the table above, VIF value is show the test of multi-collinearity. All VIF values are less than 5, therefore, there is no multi-collinearity problem. The statistical value F is a hypothesis test for the suitability of the overall linear regression model with the hypothesis that all regression coefficients are below 0.05 indicates that the model used is appropriate.

The results in Table 8 shows that all four factors including PU, PE, WOM, PT have a positive effect on digital logistics toward ecotourism. From all the above tests, the regression model chosen is suitable. The regression equation is demonstrated below:

DL= 0.071 + 0.341PU + 0.148PE + 0.354PT

From the regression equation, it can be concluded that perceived trust has the largest impact on digital logistics toward ecotourism (with B at 0.354), following by perceived usefulness(0.341) has least impact on digital logistics toward ecotourism. From the resutls, the hypotheses H1, H2, H3 are supported.

4.*2 The moderating effect of Perceived risk*

The hierachical is employed to analize the moderating effect. If Sig. of the interaction variable <0.05, it means that the variable plays a moderating role. In addition, the paper also examines the variation of the coefficient R2 and adjusted R2 with the participation of the moderator variable with the convention: the participation of the variable and R2 corresponding to adjusted R2 increase which indicates the variable playing a moderating role.

Table 10. The model analysis of moderating effect

Model	R	R^2	R^2 adjusted	S.E	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.541[a]	.292	.283	.59133	.292	32.500	3	236	.000	
2	.558[b]	.311	.299	.58472	.019	6.372	1	235	.012	
3	.584[c]	.341	.321	.57551	.030	3.526	3	232	.016	1.525

Source: Analysis from authors

Analysis results show that in model 3, the adjusted R2 coefficient is 0.321, showing the suitability level of the model is 0.321 or in other words 32.1% of the change of the dependent variable DL is explained by the independent variables PE, PU and PT and interactive variables PRxPT, PRxPU; The remaining 67.9% are due to out-of-model variables and random error. In addition, when considering model 2 and model 3, R2 increases from 0.311 to 0.341, adjusted R2 also increases from 0.299 to 0.321. This means that perceived risk moderate the relationship among perceived usefulness, perceived trust and digital logistics, except for the link between ease of use and digital logistics. Otherwise, the ANOVA analysis also show that F is 17.155 and Sig. = 0,000[d] (,0.05). This means the model is avalability and suitability. Therefore, perceived risk has a moderating role in the proposed model.

Table 11. The regression analysis of moderating effect

Construct		Unstand.		Stand.	T-Student	Sig.	Collinearity	
		B	Std.E	Beta			Tolerance	VIF
1		1.444	.247		5.835	.000		
	PU	.261	.056	.278	4.694	.000	.853	1.172
	PT	.159	.050	.179	3.153	.002	.926	1.080
2		1.717	.267		6.418	.000		
	PU	.264	.055	.281	4.801	.000	.853	1.172
	PT	.144	.050	.163	2.871	.004	.913	1.095
	PR	-.095	.037	-.138	-2.524	.012	.978	1.022
3		1.796	.268		6.698	.000		
	PU	.262	.055	.280	4.760	.000	.823	1.215
	PT	.133	.050	.150	2.678	.008	.904	1.106
	PR	-.124	.038	-.181	3.255	.001	.918	1.089
	PRxPU	-.008	.086	-.006	.089	.929	.683	1.465
	PRxPT	-.063	.050	-.070	1.269	.206	.943	1.061

Source: Analysis from authors

Table 11 shows that perceived risk has negatively moderating effect on the relationships (perceived usefulness and digital logistic success, perceived trust and digital logistic success).

DL= 0.071 + 0.341PU + 0.148PE + 0.354PT-0.006PrxPU- 0.063PRxPT

5. Conclusion

The investigation of the electronic logistics information system acceptance is relatively new to IS and nursing researchers. This study combines innovation diffusion theory, perceived usefulness, perceived ease of use, trust, perceived risk to use and proposes a brand new hybrid technology acceptance model to study users' acceptance of the electronic logistics information system in the Taiwan medical industry. Using the new hybrid technology acceptance model as a theoretical framework, this study helps practitioners and researchers understand why nurses resist using the electronic logistics information system, predict how they will respond to it, and increase their acceptance by improving the techniques and processes by which the system is implemented. Empirical testing of the extended technology acceptance model found all paths to be significant in the hypothesized directions, that is, the results of the survey strongly support the new hybrid technology acceptance model in predicting nurses' intention to use the electronic logistics information system. The proposed model can explain the users' intention to adopt the electronic logistics information system. As a result, this research added two research constructs, trust and perceived financial cost, and the findings show that the research model will be more complete and thus improve the fitness of the whole theory model. Further empirical validation of the extended model with trust and perceived financial cost in different IT contexts in the medical industry is expected.

Acknowledgement

This study is funded by Foreign Trade University with the grant number NTCS2021-32.

Reference

1. Porter, M. E. and Michael (2001), Strategy and the Internet, ilustraciones Gibbs.
2. Tan, K. S., Chong, S. C., Lin, B. and Eze, U. C. (2009), "Internet-based ICT adoption: evidence from Malaysian SMEs", *Industrial Management & Data Systems*, vol. 7 No.1, pp.234-324.
3. Wu, H. C., Lindell, M. K. And Prater, C. S. (2012), "Logistics of hurricane evacuation in Hurricanes Katrina and Rita", *Transportation research part F: traffic psychology and behaviour*, Vol. *15* No. 4, pp. 445-461.
4. Ajzen, I. and Fishbein, M. (1975)," A Bayesian analysis of attribution processes", *Psychological bulletin*, Vol. *82* No. 2, pp 261- 273.
5. Al-Somali, S.A., Gholami, R. and Clegg, B. (2009), "An investigation into the acceptance of online banking in Saudi Arabia", *Technovation*, Vol. 29 No. 2, pp. 130 - 141.
6. Schillewaert, N., Ahearne, M.J., Frambach, R.T. and Moenaert, R.K. (2005), "The adoption of information technology in the sales force", *Industrial Marketing Management*, Vol. 34 No. 4, pp. 323 - 336.
7. Gangwar, R.K., Dhumale, V.A., Gosavi, S.W., Sharma, R.B. and Datar, S.S. (2013), "Catalytic activity of allamanda mediated phytosynthesized anisotropic gold nanoparticles", *Advances in Natural Sciences: Nanoscience and Nanotechnology*, Vol. 4 No. 4, pp. 45 - 55.
8. Wu, C.S., Cheng, F.F., Yen, D.C. and Huang, Y.W. (2011), "User acceptance of wireless technology in organizations: A comparison of alternative models", *Computer Standards & Interfaces*, Vol. 33 No. 1, pp. 50 - 58.
9. Jahanmir, S. F. and Cavadas, J. (2018), "Factors affecting late adoption of digital innovations", *Journal of business research*, Vol. *88 No. 1*, pp. 337-343
10. Bauer, R. A. (1960), "Consumer behavior as risk taking", In *Proceedings of the 43rd National Conference of the American Marketing Assocation*, June 15, 16, 17, Chicago, Illinois.
11. Nguyen, T.K.C., Cao, K. D. & Le, T.P (2021). The impact of organizational factors on E-CRM success implementation. *VINE Journal of Information and Knowledge Management Systems*, incoming.
12. Tabachnick, B. G. And Fidell, L. S. (1996), Using multivariate statistics, Northridge. *Cal.: Harper Collins*.