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Study on the possibility of applying the unified theory of acceptance and use of technology in online insurance business

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Abstract: In the context of the fourth technological revolution, online insurance has become a new trend of providing insurance products around the world. In Vietnam, some insurance companies have innovatively applied new technologies in their business activities, including online insurance. However, the field of online insurance is still in slow development and there have not been studies to find out about the degree of customer acceptance of this service. Therefore, the research team conducted a survey on customers 'demand for online insurance and researched the factors affecting customers' intention and behavior for using online insurance services through the Unified theory of acceptance and use of technology (UTAUT). The research team used structural equation modeling (SEM) to evaluate the relationship between the factors in the model. The research results show that risk perception, trust, social influence, and expected performance have an impact on customers' intention to use online insurance and the relationship between customers' intention and behavior for using online insurance.

JEL: O32, O33, G22

Keywords: Online insurance, UTAUT

RESEARCH OVERVIEW

The insurance industry nowadays has made significant progress as a result of the fourth industrial revolution. Many insurance companies and researchers have taken advantage of the development of technology to enhance the efficiency of business operations and management.

Ramaswamy Velmurugan (2015) used SWOT analysis to research online insurance in India. His research result has shown that insurance companies should define their digital goals, adapt their digital thinking, pay attention to the capabilities of their organizations, and boost their current digital developments to take advantage of this digital opportunity.

Valentina Gatteschi, Fabrizio Lamberti, Claudio Demartini, Chiara Pranteda, and Victor Santamaria (2018) gave an overview of potential applications and examples of using blockchain and smart contracts in the insurance industry. They also provided a more general SWOT analysis of the blockchain, which can be used for other industries.

Thomas Holzheu et al (2000) examined the impact of e-business on the insurance industry in some aspects: current e-business trend in the insurance industry, some business models, the impact of e-business on the competition in the insurance industry, benefits for insurance customers and some risks associated with e-business in the industry.

Arpita Khare (2012) studied Indian customers' behavior toward using online insurance services. Correlation, ANOVA and multiple regression tests were run to understand customer behavior. The results suggest that improvement in technological attributes of online insurance Web sites can enhance customers' service usage.

OECD (2017) published a report on technology and innovation in the insurance sector.This report examines the various innovations taking place in the insurance sector, and what policy and regulatory impact they may have, as well as the benefits that could be reaped from innovation in the insurance sector, especially for policyholders. There are regulatory and competition considerations that need to be made as "disruption" to the industry is often about new market entries as well as new modes of service provision which may not fit the mode in which regulations was conceived upon. There are also wider privacy and data protection issues which require close attention given that InsurTech by nature usually involves a digital component to the technology.

Vijayakumar Gajenderan (2020) studied on the perception of customers on the online insurance. The study also tries to identify the whether the factors are influencing the customers to purchase the online insurance products and satisfaction level of online insurance products. The study found that factors are influencing the customers to

purchase the online insurance products and customers are absolutely satisfied the online insurance products which is offered by the insurers.

Prithviraj Dasgupta & Kasturi Sengupta (2002) studied the evolving scenario in the insurance industry in India and identify the features of online insurance that improve the conventional insurance model and thus, makes it more attractive for the Indian insurance industry to go online.

Many researchers have studied the customers' acceptance of IT. Research by Dillion and Morris (1996) has shown that IT acceptance is the readiness to apply information technology into designated tasks. Furthermore, according to research by Venkatesh et al., 2003, the intention to use a specific IT system influences customer behavior. Many theoretical points have been applied in various studies related to this issue. Many studies use individuals' behavioral intentions to predict their use of technology include Fishbein and Ajzen (1975), Fishbein and Ajzen's Theory of Reasoned Action (TRA), Ajzen (1991) Theory of Planned behavior (TPB), Davis (1989) Davis's Technology Acceptance Model, and Venkatesh et al. (2003) Unified Theory of Acceptance and Use of Technology.

RESEARCH METHOD

Research model and hypotheses

The study uses the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by researcher Venkatesh et al (2003). This theory focuses on consumers' motivation to use technology. The research model is shown in diagram 1. This model includes 8 factors. On the basis of the proposed model, the research team introduces the following hypotheses:

H1: Performance expectancy has a positive effect on the intention to use online insurance
H2: Effort expectancy has a positive effect on intention to use online insurance
H3: Social influence has a positive influence on the intention to use online insurance
H4: Facilitating conditions have a positive effect on the intention to use online insurance
H5: Facilitating conditions have a positive effect on the online insurance behavior
H7.1: Trust has a positive effect on performance expectancy
H7.2: Trust has a positive effect on effort expectancy
H7.3: Trust has a positive effect on risk perception
H7.4: Trust has a positive effect on the intention to use online insurance
Q8: The intention influences the use behaviour of online insurance

The research team has surveyed 350 customers in Hanoi, including customers who have used and have not used online insurance services. Among the collected votes, there were 257 valid responses and the return rate was 73.4%.

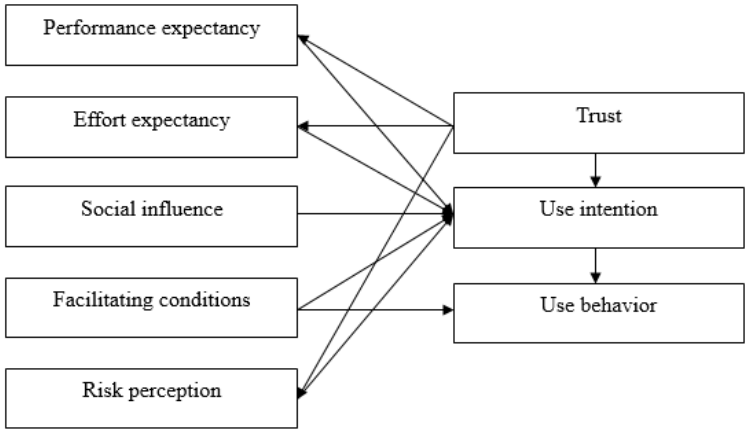

Fig.1: The research model

(Source: Venkatesh et al (2003))

Collecting and analyzing data

The scale was used from the study by Venkatesh et al. (2012), Laukkanen & Kiviniemi (2014), Ahmad et al. The questionnaire asked customers how they feel about the factors using the 5-point Likert scale, from strongly disagree (1) to strongly agree (5). The data was then processed using two soft wares SPSS 20 and AMOS 7.0.

DATA ANALYSIS AND RESEARCH RESULTS

Descriptive statistics about the investigated objects

With 257 valid responses collected, the survey results show that the majority of customers buy non-life insurance with 155 votes (accounting for 60.31%) and 102 customers (accounting for 40%) buying life insurance. Demographic survey results show that the proportion of customers by two sexes is marginally balanced with 45.14% male customers and 54.8% female customers. Most of the surveyed customers are from 20 to 50 years old (accounting for 87.55% of total customers). In terms of education level, more than 80% of clients graduate from universities and graduate schools. In addition, the descriptive statistics also show that the group with high and upper-middle-income (from 7.5 million / month or more) accounts for 77.82% of the total number of surveyed customers. The low-income group (under 7.5 million / month) accounts for a small proportion (22.18%) of the total number of surveyed customers.

Table 1: Customer survey results (N = 257)

Criteria	Frequency	Percentage
Sex		
Male	116	45.14%
Female	141	54.86%
Highest education level		
Not graduated from high school	0	0.00%
High school	43	16.73%
University or Graduate school	214	83.27%
Age		
0 - 20 years old	12	4.67%
20 - 30 years old	57	22.18%
31 - 40 years old	108	42.02%
41 – 50 years old	60	23.35%
Above 50 years old	20	7.78%
Monthly income		
0-5 million VND/ month	39	15.18%
5-7.5 million VND/ month	21	8.17%
7.5 – 10 million VND/ month	87	33.85%
Above 10 million VND/ month	113	43.97%
Type of insurance products		
Life insurance	102	39.69%
Non-life insurance	155	60.31%

(Source: SPSS 20.0)

Descriptive statistics about the variables in the model

The research team uses mean and variance in the descriptive statistics about the variables in the model. Table 2 below describes the results of the descriptive statistics of the variables in the research model.

Table 2: Descriptive statistics about the variables in the research model

Tên biến		No of Items	Mean	Std. Dev
HQUA	Performance expectancy	3	2.91	0.94
NO_LUC	Effort expectancy	4	2.30	0.76
AHUONG	Social influence	3	2.54	0.91
DKTL	Facilitating conditions	4	2.58	0.72
RUI_RO	Risk perception	4	4.12	0.70
NIEM_TIN	Trust	3	2.51	0.88
Y_DINH	Use intention	3	2.05	0.65
HV	Use behavior	4	2.60	0.65

(Source: SPSS 20.0)

Exploratory factors analysis

The research team uses the Principal Axis method of Factor Extraction with Promax rotation (Gerbing & erson, 1988) with load factor ≥ 0.5 (Hair et al., 1998) for both independent and dependent variables (using the Likert scale). Then we perform Bartlett's test to consider hypotheses about the correlation between the observed variables. The first EFA analysis results show that the total variance extracted is 56.97% (> 50%), KMO is 0.841 (> 0.5) and Bartlett's test was statistically significant (Sig. <0.05). The first EFA results show that the observed variables NO_LUC2 and RUI_RO5 have factor loadings <0.5, so these variables are excluded from the model. The second EFA results show that the total variance extracted was 59.59% (> 50%), KMO was 0.85 (> 0.5), Bartlett test was statistically significant (Sig. <0.05).

Table 3: Results of exploratory factors analysis

Variable	Code	Scale	Factor Loadings
Factor 1 Performance expectancy (3 factors)	HQUA1 HQUA3 HQUA2	I think buying online insurance is useful in my daily life Buying online insurance can help me get things done faster Buying online insurance can increase my work efficiency	0.800 0.764 0.733
Factor 2 Effort expectancy (3 factors)	NO_LUC4 NO_LUC3 NO_LUC1	It's easy for me to be skilled when it comes to buying insurance online I find buying online insurance easy with insurance company deals Learning how to buy online insurance is easy for me	0.816 0.794 0.570
Factor 3 Social influence (3 factors)	AHUONG1 AHUONG2 AHUONG3	People important to me advise that I should buy online insurance People affecting my behavior advise that I should buy online insurance People around me think that it is important to buy online insurance	0.889 0.791 0.565
Factor 4 Facilitating conditions (4 factors)	DKTL3 DKTL2 DKTL4 DKTL1	Online insurance is compatible with the technology I use I have the knowledge needed to buy online insurance I can get help from someone else when I have trouble buying online insurance I have the equipment to buy insurance online (phone, computer ...)	0.877 0.812 0.779 0.556
Factor 5 Risk perception (3 factors)	RUI_RO2 RUI_RO3 RUI_RO1	When a transaction fails, I am afraid that I cannot get compensation from the insurance company My personal information could be exposed when my account is hacked in the insurance company Buying online insurance might have errors in the transaction	0.775 0.736 0.685
Factor 6 Trust (3 factors)	NIEM_TIN3 NIEM_TIN2 NIEM_TIN1	I believe that online insurance always takes user preferences into account I believe online insurance lives up to its claim I believe buying online insurance online is reliable	0.831 0.682 0.575
Factor 7 Use intention (3 factors)	Y_DINH2 Y_DINH3 Y_DINH1	I will always try to buy online insurance in my daily life I plan to buy insurance online regularly I plan to continue to buy online insurance in the future	0.794 0.792 0.774
Factor 8 Use behavior (4 factors)	HV4 HV3 HV2 HV1	I will continue to buy online insurance for the time being I enjoy buying online insurance I think buying online insurance is the right decision for me Overall buying online insurance makes me feel satisfied	0.767 0.715 0.703 0.512

(Source: SPSS 20.0)

After the exploratory factors analysis, the model has no difference with the research model; only some observed variables are not reliable enough to be included in the research variable. There is no new group of factors.

Confirmatory Factor Analysis (CFA)

The results of confirmatory factor analysis confirm that the research model is suitable with the market data with the results CMIN / df = 1.190 <2, RMSEA = 0.028 <0.06. TLI value = 0.976; GFI = 0.909; CFI = 0.980 satisfies the condition> 0.9; PCLOSE = 1,000> 0.05. The P-value results of the observed variables representing the factors are valued at Sig. = 0.000, so the observed variables are confirmed to well represent CFA model factors. Besides, the results of confirmatory factor analysis also show that weights (standardized) are> 0.5 and weights (not standardized) are statistically significant (Sig. <0.000). Extracted variance (AVE)> 0.5 so the concepts achieve convergent validity. The analysis results also show that the square root of AVE is greater than the correlations among variables, the value of MSV is less than AVE, and so the distinction is guaranteed.

Table 4: Results of testing the distinctiveness of the scale

	AVE	**MSV**	**NO_LUC**	**AHUONG**	**DKTL**	**HQUA**	**NIEM_TIN**	**RUI_RO**	**Y_DINH**	**HV**
NO_LUC	0.505	0.073	**0.711**							
AHUONG	0.622	0.302	0.254**	**0.789**						

DKTL	0.573	0.027	0.072	0.151*	**0.757**					
HQUA	0.608	0.319	0.266**	0.446***	0.067	**0.78**				
NIEM_TIN	0.549	0.391	0.271**	0.388***	0.166*	0.370***	**0.741**			
RUI_RO	0.526	0.13	-0.170*	-0.117	0.001	-0.228**	-0.226**	**0.725**		
Y_DINH	0.644	0.416	0.227**	0.550***	0.1	0.517***	0.583***	-0.361***	**0.802**	
HV	0.518	0.416	0.176*	0.502***	-0.04	0.565***	0.625***	-0.324***	0.645 ***	**0.72**

(Source: SPSS 20.0)

Testing reliability

Table 5: Results of testing the reliability of the scale

Variable		**Number of factors**	**Cronbach's Alpha**	**CR**	**AVE**
HQUA	Performancexpectancy	3	0.821	0.823	0.608
NO_LUC	Effort expectancy	4	0.751	0.752	0.505
AHUONG	Social influence	3	0.823	0.831	0.622
DKTL	Facilitating conditions	4	0.831	0.839	0.573
RUI_RO	Risk perception	4	0.684	0.769	0.526
NIEM_TIN	Trust	3	0.785	0.784	0.549
Y_DINH	Use intention	3	0.843	0.844	0.644
HV	Use behavior	4	0.805	0.811	0.518

(Source: SPSS 20.0)

The analysis results show that the Cronbach's Alpha value of each factor is greater than 0.7 and the total value of the correlation coefficient reaches greater than 0.3. In addition, the combined reliability is greater than 0.7 and the variance extracted of each factor is greater than 0.5. Thus, the factors in the model ensure reliability.

3.6. Structural Equation Modeling (SEM)

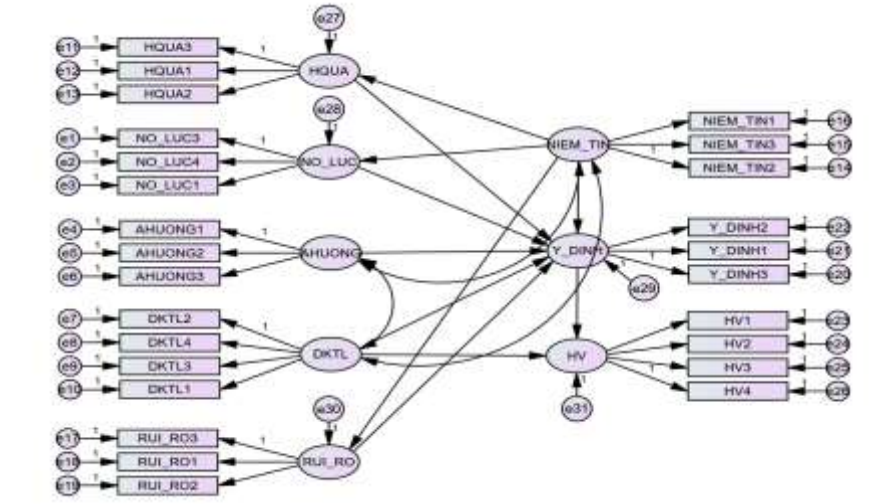

Fig.2: Structural Equation Modeling (SEM)

(Source: AMOS 7.0)

The results of the SEM analysis show that all values are satisfactory; therefore, the model is completely suitable with market data and can be used to verify the expected relationships in the hypothesis model (Figure 5).

According to the analysis results, the factors of effort expectancy and facilitating conditions do not affect the intention to use online insurance, the factor facilitating conditions do not affect the use behavior (value P-Value> 0.05, not statistically significant). This result reflects the fact that although a lot of customers currently use smartphones and have an internet connection, they do not have the intention to use online insurance. In order to better understand the cause of the problem, the research team interviewed customers and the result is nearly 35% of customers answered that they do not know about online insurance, and nearly 50% of customers answered that buying online insurance is quite risky for them. Also, the factor of effort expectancy also has no impact on the intention to use online insurance.

This problem can be explained by the fact that customers, especially young customers, have a good understanding and easily use the information technology to purchase insurance; therefore the decision of

whether to buy insurance online or not depends on another factor. They are more concerned about the risks and benefits of using a service than methods to buy products on computers or phones. In addition, the research results also show that the trust factor has an impact on risk perception, performance expectancy, and effort expectancy. Accordingly, as trust increases, risk perception decreases and has a reverse impact on the intention to use online insurance.

Table 6: Regression coefficients

			Estimate	S.E.	C.R.	P
HQUA	<---	NIEM_TIN	.434	.081	5.347	***
NO_LUC	<---	NIEM_TIN	.321	.078	4.125	***
RUI_RO	<---	NIEM_TIN	-.170	.054	-3.119	.002
Y_DINH	<---	HQUA	.188	.049	3.792	***
Y_DINH	<---	NO_LUC	-.026	.048	-.539	.590
Y_DINH	<---	AHUONG	.239	.052	4.572	***
Y_DINH	<---	DKTL	-.014	.043	-.322	.747
Y_DINH	<---	RUI_RO	-.236	.072	-3.282	.001
Y_DINH	<---	NIEM_TIN	.305	.067	4.542	***
HV	<---	Y_DINH	.596	.076	7.811	***
HV	<---	DKTL	-.062	.039	-1.594	.111

(Source: SPSS 20.0)

Based on the order of regression coefficients, we can see the impact order of the factors:

Table 7: Impact order of factors

Impacted variables	**Order of impacting variables**
Y_DINH	NIEM_TIN > AHUONG > RUI_RO >HQUA

(Source: SPSS 20.0)

Table 8: Squared Multiple Correlations

Factor	Risk perception	Performance expectancy	Effort expectancy	Use intention	Use behavior
Value	0.064	0.179	0.107	0.616	0.523

(Source: SPSS 20.0)

Table 8 shows that:

- Value R^2 with regression of dependent variable RUI_RO is 0.064. Thus, the independent variable NIEM_TIN explains 6.4% of the variation of the RUI_RO variable.
- The value R^2 with the regression of the dependent variable HQUA is 0.179. Thus, the independent variable NIEM_TIN explains 17.9% of the variation of the HQUA variable.
- The value R^2 with the regression of the dependent variable NO_LUC is 0.107. Thus, the independent variable NIEM_TIN explains 10.7% of the variation of the NO_LUC variable.
- The value R^2 with the regression of the dependent variable Y_DINH is 0.616. Thus, the independent variables are statistically significant to explain 61.6% of the variation of Y_DINH variable.
- The value R^2 with the regression of the dependent variable HV is 0.523. Thus, the independent variable Y_DINH explain 52.3% of the variation of HV.

CONCLUSION

The research results show that online insurance in Vietnam is in the early stage with a modest number of users and current customers mostly gain access to insurance services through traditional sales channels. In addition, the study also shows that the Unified Theory of Acceptance and Use of Technology (UTAUT) model is most appropriate for online insurance in Vietnam. In addition, this study has shown the impact of risk perception, trust, social influence, and performance expectancy variables on the intention to use online insurance as well as the relationship between the two variables: the use intention and the use behavior in online insurance.

According to the research results, the research team would like to propose some solutions to develop online insurance in Vietnam as follows:

Firstly, the Vietnam government needs to promptly supplement the laws on online transactions and payments. In addition, businesses need to ensure network security in providing services to customers and instruct customers to use online insurance services safely. All of the above measures can help customers avoid risks that may arise in online transactions. As well as that, customers' confidence in online insurance services can be improved.

Secondly, the education system should be completed comprehensively in order to improve the people's knowledge of online insurance in particular and high-tech insurance in general. Besides, businesses also need to

promote the implementation of different marketing methods such ash online channels, newspapers, radio, television, email ... Owing to these measures, the number of people using online insurance will increase increasingly, thereby sales of online insurance services can increase.

The research team believes that this model will be very useful for researchers in the management field as well as practical application in the current Vietnamese insurance industry.

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