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Factors Affecting the Intention to Participate in E-Commerce of Vietnamese Businesses

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Abstract

E-commerce has emerged as a transformative force in the global business landscape, offering enormous opportunities for businesses to expand their reach and enhance their competitiveness. In the context of Vietnam, a rapidly growing economy in Southeast Asia, understanding the factors that influence businesses' intention to participate in e-commerce is extremely important. Therefore, we have proposed a research model including 12 factors that affect businesses' intention to participate in e-commerce: Government regulations, Available platform selection, Competitive advantage requirement, Internet infrastructure, Customer readiness, Cognition, Capability, Culture of innovation, Internal regulations, Model to participate, Infrastructure, Technology background. We conducted a survey with 300 businesses in 3 regions in Vietnam. After eliminating some votes with insufficient information, the study obtained 295 votes that met the requirements. In addition, the study uses multiple linear regression equation modeling to measure the impact of factors on businesses' intention to participate in e-commerce. Results: Besides external factors, businesses' intention to participate in e-commerce is also influenced by internal factors. Based on these findings, businesses intending to participate in the e-commerce market will have the right direction and take necessary actions to help their businesses develop further.

Keywords: *Enterprise, Intention, External Factors, Internal Factors, Participating In E-Commerce.*

1. Introduction

On a global scale, it has been established that e-commerce has the potential to provide many opportunities not previously available through new technological developments, with favorable impacts on trade, investment, business transactions, and market penetration [18]. In recent years, Vietnam's e-commerce market has increasingly expanded and become a popular business method. With the diversity of operating models, objects, processing processes, and supply of goods and services along with the support of internet infrastructure, and modern technology applications, e-commerce has become an important pillar of digital economic development. Despite knowing how great opportunities and benefits e-commerce brings to participants, some companies have not yet decided to participate. Although the causes can vary widely, barriers can generally be divided into internal and external types [5], despite the growing importance of e-commerce adoption for fierce competition not only in the post-COVID recovery but also to develop and keep up with the general world trend. No research has been conducted in Vietnam to study or investigate the overall impact of both external and

internal salient factors on businesses' decisions to participate in the online market. This study will continue to review previous research, both domestic and international, on a broader scope of how external and internal factors influence businesses' intention to participate in online markets in Vietnam.

2. Literature Review

2.1. External Attributes

2.1.1. Government regulations

Each country faces specific challenges that require customized commercial adoption and culturally appropriate tactics [8],[13],[14]. On the one hand, government policies can hinder online commerce due to differences in regulatory frameworks, some for reasons considered less legitimate, such as protectionism or promoting domestic businesses, and otherwise for legitimate or protectable reasons, such as privacy, consumer protection, and national security [12].

2.1.2. Available platform selection

Creating and hosting e-commerce applications in-house, hosting at a commercial service provider (keeping servers at the hosting company or rent space on the hosting company's servers), partnering with another website, joining a shopping mall, or implementing outsourcing are just some of the options available to businesses [7]. It is important to assess resources and needs. Key factors in determining needs are project scope, budget size, capacity level, and timing [6].

2.1.3. Competitive Advantage Requirement

Customers and complementary businesses should always be at the core of a company's strategy, regardless of whether the company operates in the "old" or "new" economy. Businesses need to evaluate how their online presence can differentiate them from their competitors. The system enters a zone of increasing profitability as participation and system value increase [3].

2.1.4. Internet infrastructure

The emergence of the Internet greatly supports the development of e-commerce. The Internet is important in commercial transactions as it improves speed and accuracy [16]. E-commerce, conducted via the Internet, has become an important channel for many companies thanks to the development and spread of Internet technology over several decades [21].

2.1.5. Customer readiness

Empirical research has also highlighted the advantages of online shopping. The use of the Internet reduces the distance and time barriers that exist between businesses and consumers. In addition, it can encourage increased product diversity, which will improve product quality and customer satisfaction, as well as administrative procedures, labor and management productivity, and cost-cutting measures [17]. E-commerce is being adopted by rural businesses to enhance the value of their products and strengthen relationships with customers [19].

Ultimately, e-commerce can help reshape the connection between suppliers and customers, while streamlining company operations [10].

2.2. Internal Attributes

2.2.1. Human

2.2.1.1. Cognition

The theory of planned behavior (TPB) was introduced by Ajzen with a basis in social psychology [1]. These include perceived behavioral control, subjective norms, and attitudes. Taylor and Todd [20] advance theory in the decomposition TPB by arguing that it provides information technology managers and scholars interested in studying systems implementation with a thorough understanding of behavior and intention to use [20].

2.2.1.2. Capability

Business and IT leaders worldwide have encountered a common challenge: a skills shortage. This includes soft skills (such as communication or management) and hard skills (such as technical competence).

2.2.1.3. Culture of innovation

Innovation has always been essential to maintain competitive advantage and deliver business success [4],[22]. It can be used to meet customer requirements and adjust to changes in the business environment [15].

2.2.2. Internal regulations

All regulations governing the operations of an enterprise are considered internal regulations. Therefore, for the conversion to apply online sales effectively, each unit needs to review and change existing problems in its internal system.

2.2.3. Model to participate

Businesses can consider the business model itself as an innovation subject and implement business models to support technological innovation and technology management [11]. Chesbrough developed the idea of open innovation as a style of invention in which organizations go beyond their boundaries to use internal and external sources of ideas to advance the business rather than rely on interior ideas [2].

2.2.4. Technology

2.2.4.1. Infrastructure

Many people admit that the scale of technology infrastructure is a critical aspect that directly affects each country's e-commerce economy. With IT infrastructure serving as the fundamental building block of every business and organization, these investments are necessary to support the demands of digital transformation.

2.2.4.2. Technology background

E-commerce platforms provide customers with real-time access to global markets. Likewise, thanks to new technologies, manufacturers can connect with customers to deliver

goods and services almost instantly and in previously unimaginable ways. According to the simulations, digital technology will significantly affect trade, facilitating a faster digital revolution.

3. Research Methods

3.1 Research hypothesis

From the above arguments, we hypothesize that:

Hypothesis 1: Supportive and clear government regulations will motivate businesses to accept participation in e-commerce.

Hypothesis 2: Diverse online platform options will promote businesses' adoption of e-commerce.

Hypothesis 3: The requirement for competitive advantage will motivate businesses to accept participation in e-commerce.

Hypothesis 4: Favorable and advanced internet infrastructure will promote businesses to accept participation in e-commerce.

Hypothesis 5: Customer readiness will motivate businesses to accept participation in e-commerce.

Hypothesis 6: Quickly adapting personnel will promote businesses to accept participation in e-commerce.

Hypothesis 7: High human resource capacity will promote businesses to accept participation in e-commerce.

Hypothesis 8: A strong culture of innovation will motivate businesses to accept participation in e-commerce.

Hypothesis 9: Clear and flexible internal regulations will promote businesses to accept participation in e-commerce.

Hypothesis 10: Choosing the appropriate application model will promote businesses to accept participation in e-commerce.

Hypothesis 11: Advanced or flexible technological infrastructure will promote businesses' adoption of e-commerce.

Hypothesis 12: A strong technology platform will promote businesses to accept participation in e-commerce.

3.2 Research models

The research model is presented in Figure 1.

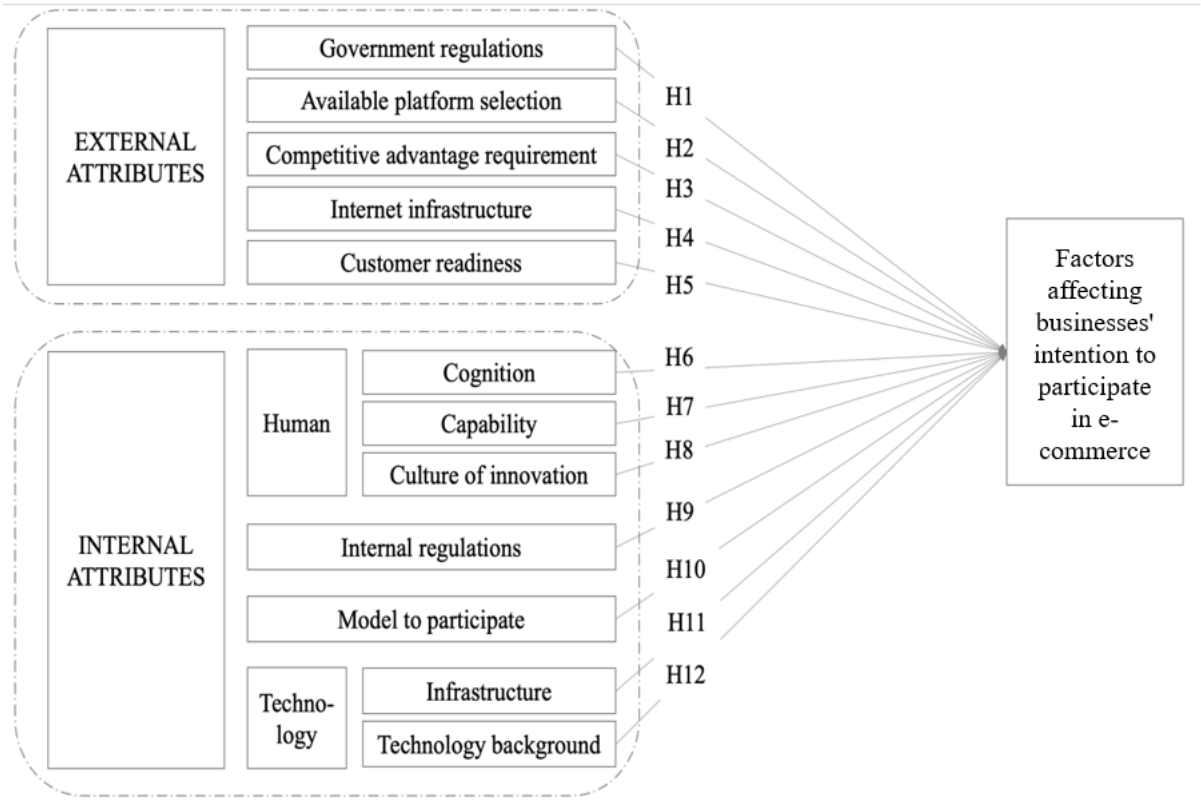


Figure 1: Proposed research model

3.1. Data

With 300 businesses surveyed in 3 regions in Vietnam, after eliminating some questionnaires with insufficient information, the study obtained 295 questionnaires that met the requirements for analysis, with a rate of 98.3% with the following characteristics:

Of the 295 surveyors representing 295 companies participating in the survey, 42.7% are company leaders, and 57.3% are department managers of the company. The proportion of companies participating in the study in the three regions of Vietnam is equal (about 33%). The businesses surveyed were mainly domestic companies, including joint stock companies (47.5%) and limited liability companies (42.0%). The size of the companies is primarily tiny (53.2%) and medium (39.7%). The level of participation in e-commerce is only 26.4%, reaching the regular class, while the level is mainly average and occasional.

Table 1. Post-survey statistics meeting research requirements

Survey content		Quantity (295)	Rate %
Position	Department management	169	57.3%
	Company leadership	126	42.7%
Type of business	Limited liability company	124	42.0%
	Joint stock company	140	47.5%
	Joint venture	31	10.5%
Scale	Small	157	53.2%
	Medium	117	39.7%
	Big	21	7.1%
Area	Northern	98	33.2%
	Central region	98	33.2%
	Southern	99	33.6%

3.2. Analytical method

After being collected, the data is subjected to descriptive statistical analysis, analyzing the scale's reliability using Cronbach's Alpha coefficient, EFA exploratory factor analysis, correlation analysis, and measuring the impact of factors in the decision to participate and check the assumptions and flaws of the regression model. In addition, the study uses an ANOVA test to measure differences in e-commerce adoption according to business characteristics. Support tools are Excel and SPSS 25 software.

4. Results and Discussion

4.1. Results of testing the reliability of the scale

Table 2. Results of testing the reliability of the scale

No.	Measurement content	Cronbach's Alpha value
1	Government support policy	0.910
2	Available platform selection	0.902
3	Competitive advantage	0.943
4	Internet infrastructure	0.916
5	Customer readiness	0.872

6	Staff	0.892
7	Leadership team	0.833
8	Corporate innovation culture	0.869
9	Enterprise policy	0.849
10	Applicable model	0.892
11	Enterprise technology infrastructure	0.881
12	Technology platform of the business	0.884
13	Intention to participate in e-commerce	0.865

The table above describes in detail the results of reliability testing for the 13 scales included in the study with Corrected Item-Total Correlation >0.3, total Cronback Alpha, and component Cronback Alpha both >0.7. Thus, the 13 scales in the survey ensure reliability and continue to be included in exploratory factor analysis.

4.2. Results of exploratory factor analysis

To measure the validity of the scales in the thesis, the author uses the exploratory factor analysis method to measure their convergence and discrimination. The condition for the scales to ensure validity is that the KMO coefficient must be within the range from 0.5 to 1; the Barlett test has a significance level of less than 0.05; the Eigenvalue value greater than or equal to 1; total variance extracted is greater than or equal to 50%; Factor loadings of factors >0.5

Exploratory factor analysis for independent variables

The results of exploratory factor analysis with scales measuring independent variables are presented in detail in Table 3, the specific measured values are as follows: KMO coefficient = 0.906 (range from 0.5 to first); Barlett test has a significance level of <0.001; Eigenvalue = 1.018 > 1; Total variance extracted = 77.584% > 50%; The loading factor of the lowest factors is 0.721 > 0.5.

From this result, the author concludes that the study's factor analysis method is appropriate, with 46 observed variables included in the EFA analysis, 12 factors were extracted and represented 77.584% of the variance of the 36 observed variables. Besides, the loading coefficients of all factors are >0.5, so new factors are created to ensure convergence and discrimination.

Table 3. Results of KMO -Bartlett's Test analysis and extracted variance

No.	Measure		Value
1	***Kaiser-Meyer-Olkin Measure of Sampling Adequacy.***		0.906
2	***Bartlett's Test of Sphericity***	Chi-Square Value	10292.044
		df	1035
		Sig.	0.000

3	***Total Variance Explained***	The number of forming factors	12
		Eigenvalue	1.018
		Total % variance extracted	77.584

EFA analysis for dependent variable

The results of exploratory factor analysis for the dependent variable are presented in detail in Table 4. The analysis results show that with three observed variables included, a single factor was extracted with a total % variance extracted of 78,575 %, corresponding to Eigenvalue = 2.363 and factor loading > 0.05. Besides, the KMO value and Bartlett's test both show that this factor analysis method is appropriate.

Table 4. Results of EFA analysis for dependent variable

4.3. Results of analysis of factors affecting businesses' intention to participate in e-commerce

No.	Measure		Value
1	***Kaiser-Meyer-Olkin Measure of Sampling Adequacy.***		0.738
2	***Bartlett's Test of Sphericity***	Chi-Square Value	417.966
		df	3
		Sig.	0.000
3	***Total Variance Explained***	The number of forming factors	1
		Eigenvalue	2.363
		Total % variance extracted	78.575
		Factor Loading	>0.5

4.3.1. Correlation analysis

Use the covariance matrix to analyze the relationship of independent variables with the dependent variable and the relationship of independent variables with each other. The correlation coefficient indicates the correlation's magnitude, the correlation's direction, and whether this correlation is statistically significant or not. Besides, the correlation coefficient also shows whether the independent variables are likely to have multicollinearity or not. Usually, if two independent variables are strongly correlated (>0.8), there is a high possibility of multicollinearity.

Table 5. Correlation coefficient matrix

	YDDN	CSCP	LTCT	NTCS	CSHT	SSKH	CSDN	DNNS	MHAD	VHDM	DNLD	HTDN	CNDN
YDDN	1												
CSCP	.542**	1											
LTCT	.548**	.417**	1										
NTCS	.469**	.394**	.491**	1									
CSHT	.501**	.398**	.377**	.467**	1								
SSKH	.438**	.343**	.356**	.341**	.297**	1							
CSDN	.408**	.325**	.301**	.345**	.235**	.247**	1						
DNNS	.478**	.407**	.420**	.350**	.305**	.337**	.250**	1					
MHAD	.491**	.329**	.372**	.373**	.332**	.387**	.374**	.361**	1				
VHDM	.494**	.510**	.279**	.312**	.348**	.344**	.249**	.444**	.349**	1			
DNLD	.377**	.343**	.271**	.397**	.377**	.255**	.220**	.335**	.297**	.294**	1		
HTDN	.447**	.454**	.414**	.399**	.404**	.288**	.263**	.482**	.436**	.453**	.293**	1	
CNDN	.558**	.504**	.397**	.446**	.360**	.301**	.346**	.439**	.468**	.389**	.344**	.467**	1

*** is statistically significant at <1% level, Government support and policy (CSCP); Available Platform (NTCS); Competitive advantage (LTCT); Internet infrastructure (CSHT); Customer readiness (SSKH); Human resources team (DNNS); Leadership team (DNLD); Corporate innovation culture (VHDM); Enterprise policy (CSDN); Application model (MHAD); Enterprise technology infrastructure (CSHT); Enterprise technology platform (CNDN).*

That is demonstrated by the findings of the independent variable to dependent variable correlation analysis (YDND). The intention of firms to engage in e-commerce is positively correlated with all independent factors in a statistically meaningful way. The dependent and independent variables have a correlation coefficient ranging from 0.337 to 0.558. Therefore, it can be said that the variables are correlated at an average level. However, this is only a univariate relationship. The study will use multiple linear regression in the following section to measure the simultaneous impact of independent and dependent variables.

Besides, the table above also measures the relationship of independent variables with each other. All independent variables included in the model have a statistically significant positive relationship with each other. However, the level of correlation between these variables is moderate and weak. With this result, the author can assume no multicollinearity phenomenon exists between the independent variables. However, to confirm whether this has happened or not, the study will use the variance magnification factor VIF in the following section to measure before concluding.

4.3.2. Results of regression analysis and tests

The results of the analysis using the multiple linear regression model are presented in Table 6 below:

Table 6. Summary of regression results

Independent variables		Beta coefficient	Critical value (t)	P.value	Tolerance	VIF
1	CSCP	0.11*	2.19	0.030	0.56	1.79
2	LTCT	0.21*	4.27	0.000	0.62	1.61
3	NTCS	-0.0003	-0.01	0.995	0.58	1.72
4	CSHT	0.17*	3.52	0.001	0.66	1.51
5	SSKH	0.09*	2.02	0.044	0.74	1.36
6	CSDN	0.10*	2.30	0.022	0.78	1.29
7	DNNS	0.08	1.54	0.124	0.62	1.61
8	MHAD	0.10*	2.12	0.035	0.63	1.59
9	VHDM	0.14*	2.86	0.005	0.62	1.61
10	DNLD	0.03	0.69	0.493	0.74	1.35
11	HTDN	-0.04	-0.87	0.387	0.58	1.72
12	CNDN	0.17*	3.35	0.001	0.57	1.76
Beta (0)		$4x10^{-17}$				
R2				0.582		
Adjusted R2				0.564		
F - statistic				32.726		
Prob (F- statistic)				<0.001		
Durbin-Watson				1.981		

*** is statistically significant at <1% level, Government support and policy (CSCP); Available Platform (NTCS); Competitive advantage (LTCT); Internet infrastructure (CSHT); Customer readiness (SSKH); Human resources team (DNNS); Leadership team (DNLD); Corporate innovation culture (VHDM); Enterprise policy (CSDN); Application model (MHAD); Enterprise technology infrastructure (CSHT); Enterprise technology platform (CNDN).*

Check the fit of the model

The analysis results show that the test value F = 32.736 and its significance level is < 0.001, so this model is suitable. R2 coefficient = 0.582, which means that with six independent variables included in the model analysis, the model explains 58.2% of the change in the dependent variable. The variance inflation factor (VIF) of all independent variables included in the model is <2, so multicollinearity does not occur. Durbin-Watson value = 1.981; based on the Durbin-Watson table lookup value, 1.981 is in the range (du; 4-du), so autocorrelation does not happen.

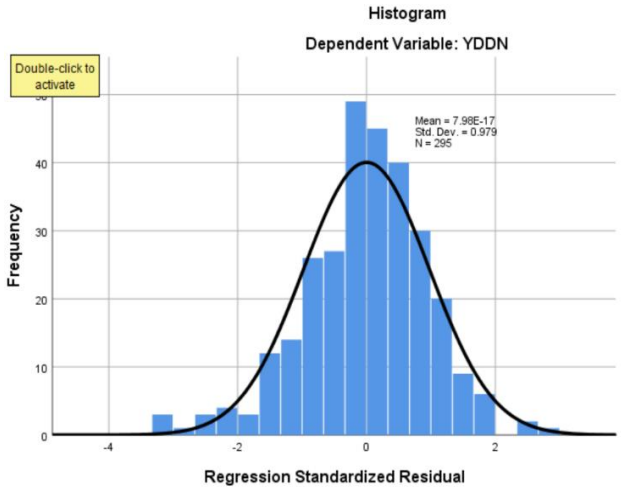
Check other defects of the model

For regression using the OLS method (ordinary least squares), in addition to the above suitability conditions, the model needs to ensure the condition of constant error variance. To check the variance of constant errors, the study uses the distribution graph of the residuals. The model does not have heteroskedasticity if the residuals are normally distributed and do not interact with each other.

The results of checking the distribution of the residuals shown in Figures 2 and 3 show:

The mean value of the residual =7.98x10-17 approaches 0, and the standard deviation=0.979 approaches 1, so the regression residual has a normal distribution;

Figure 2. Frequency distribution plot of regression residuals

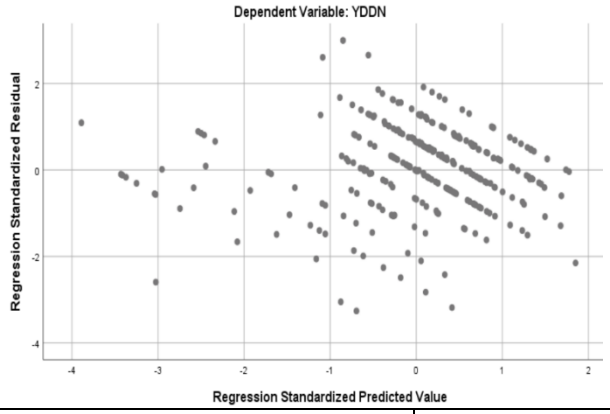


Besides, the scatter plot of the standardized residual also shows that the values are evenly dispersed around the value 0.

Figure 3. Split plot of regression residuals

Thus, from the results of the above tests, the author concludes that the research model the thesis builds is entirely appropriate.

Testing research hypotheses



Hypothesis	Inspection results	Conclusions

H1	Path Coefficients is 0.11 and P-Value < 0.05	Accept hypothesis H1
H2	P-Value > 0.05	Do not accept hypothesis H2
H3	Path Coefficients is 0.21 and P-Value < 0.05	Accept hypothesis H3
H4	Path Coefficients is 0.17 và P-Value < 0.05	Accept hypothesis H4
H5	Path Coefficients is 0.09 và P-Value < 0.05	Accept hypothesis H5
H6	P - Value > 0.05	Do not accept hypothesis H6
H7	P- Value > 0.05	Do not accept hypothesis H7
H8	Path Coefficients is 0.14 và P-Value < 0.05	Accept hypothesis H8
H9	Path Coefficients is 0.10 và P-Value < 0.05	Accept hypothesis H9
H10	Path Coefficients is 0.10 và P-Value < 0.05	Accept hypothesis H10
H11	P-Value >0.05	Do not accept hypothesis H11
H12	Path Coefficients is 0.17 và P-Value < 0.05	Accept hypothesis H12

Based on the above results, the model measuring the influence of factors on the intention to adopt and expand e-commerce of Vietnamese businesses is rewritten in the form of an equation as follows:

$YDDN = 4x10^{-17} + 0.01CSCP + 0.21LTCT + 0.17CSHT + 0.09SSKH + 0.10CSDN + 0.10MHAD + 0.14\ VHDM + 0.17CNDN.$

4.4. The relationship between characteristics of survey subjects and businesses' intention to participate in e-commerce

To compare the difference in intention to adopt e-commerce according to business characteristics, the study uses ANOVA test. The analysis results are summarized in the table below.

Table 8. Differences in participation intention by business characteristics

Characteristic		Levene test (P)	Mean test (P)
Type of business	Limited liability company	0.09	0.89
	Joint stock company		
	Joint venture		
Scale	Small	0.34	0.43

	Medium		
	Big		
Area	Northern		
	Central region	0.24	0.15
	Southern		

The table above describes the differences in intention to adopt e-commerce according to business characteristics. The analysis results show that the significance level in testing the variance of each group (Levene test (P) is >0.05; therefore, the variance of the groups in each business characteristic is equal. Along with that, the significance level Meaning in the mean comparison (Mean test (P) of all groups in each business characteristic >0.05. Therefore, the author concludes that there is no difference in intention to participate in e-commerce according to the characteristics of business.

5. Conclusion

Research has shown that besides external factors, businesses' intention to participate in e-commerce is also influenced by internal factors. The study has many similarities and differences compared to previous studies in the world. Based on these findings, businesses intending to participate in the e-commerce market will have the right direction and take necessary actions to help their businesses develop further.

5.1. Recommendation

With the development of e-commerce, it is greatly supported by the development of the Internet. E-commerce is fertile ground for businesses to exploit, helping them develop and earn high profits. Primarily, through the prolonged COVID-19 pandemic, many customers have accessed e-commerce, and e-commerce will grow even more vital.

5.2. Limit

This research only stops at studying the intention to participate in e-commerce. Besides, the scope of the study is wide, the use of convenience sampling method may not be representative of the entire target group.

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