The Impact of Digital Transformation on the Competitive Advantage of Businesses: Case Study of Businesses Providing Logistic Services in HCMC, Vietnam

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ARTICLE INFO	ABSTRACT
Published Online: **24 July 2024** **Corresponding Author:** **Van Nguyen Van**	This study uses primary data from a survey of 380 observations in Ho Chi Minh City, Vietnam, and adopts the Exploratory Factor Analysis, Confirmatory Factor Analysis, and Linear Regression Modeling with Bootstrap analysis for a reliable test of Regression Modeling. Its result shows that factors affecting Competitive advantage included Digital transformation leadership, Government support policy, Competitive pressure, Information Technology Competency, and Organizational agility.

1. INTRODUCTION

Vietnam is considered a potential and attractive market for the development of the logistics service industry. However, businesses providing logistics services in Vietnam also face fierce competition, requiring businesses providing logistics services in Vietnam to have solutions to enhance competitive advantage, to succeed in the 4.0 Industrial Revolution. Furthermore, to avoid falling behind, countries must carry out digital transformation, especially for businesses. However, the initial results and successes in the digital transformation of Vietnamese logistics businesses are still very modest. Most businesses are struggling to find the right way to transform digitally, the industry's application of science and technology, innovation, creativity, and digital transformation still has many limitations from thinking and awareness to receiving capacity and financial resources. The biggest challenge today for businesses providing logistics services is that they have not found compatible solutions between the operating management systems of their businesses and their customers; Difficulties in capital and human resources; Haven't found suitable conversion technology yet; The amount of existing information that needs to be digitized is too large. In addition to the internal factors of businesses, technological factors and competitive pressures, policy mechanisms also impact the digital transformation process of businesses, and the institutional framework for digital transformation in Vietnam also cumbersome, although the government has strengthened the National Committee on digital transformation according to Decision No. 1619/QD-TTg dated September 24, 2021, similar Committees were also established at the provincial/city level in the coming months. The Chairman of the Provincial/City Peoples's Committee is the head of the Committee. However, at the operational stage, major tasks in the transformation program are spread out, making coordination and policy implementation challenging (Vu Hoang Linh and Pham Anh Tuan, 2022).

This leads to problems facing digital transformation and the competitive advantage of logistics service businesses. These are also challenges for researchers and business managers. This research focuses on (i) Identifying factors affecting the competitive advantage of businesses applying digital transformation; (ii) Building a quantitative model for the above relationship; and (iii) policy implications to enhance competitive advantage for businesses providing logistics services. This study uses primary data from a survey of 380 observations (digital transformation experts, business managers) in Ho Chi Minh City to build a practical basis for the quantitative model. Ho Chi Minh City is the economic center of Vietnam, with the largest number of businesses providing logistics services in the country. Vietnam has about 4,000 businesses in the logistics field, 70% of which are concentrated mainly in the city (Thi Ha, 2023). For Ho Chi

Minh City, logistics is determined to be a very important industry, having an impact on sustainable, long-term development for economic growth. Accordingly, Ho Chi Minh City has approved the project "Developing the Logistics Industry to 2025, with a vision to 2030". Ho Chi Minh City strives for the growth rate of logistics service revenue of businesses to reach 15% by 2025 and 20% by 2030, the contribution of logistics to Ho Chi Minh City's GRDP by 2025 reaches 10% and by 2030. By 2030 it will reach 12%, contributing to reducing the country's logistics costs compared to national GDP by 2025 to about 10-15% (Cam Tu, 2023).

2. LITERATURE REVIEWS
Background theories
"Resource-Based View" theory:
The distinctive resources and capabilities of a company play a vital role in enhancing its competitive advantage and driving profitability (Penrose, 1959; Wernerfelt, 1984; Barney, 1991; Grant, 1991). The Resource Based View (RBV) theory is built on two key assumptions: (1) Enterprises vary in their internal resources and capabilities.(2) Special internal resources and capabilities, which cannot be imitated or outperformed by competitors, become the basis for competitive advantage. RBV theory considers resource characteristics and strategic factors to explain firm heterogeneity and sustainable advantage (Barney, 1991). The main core of RBV is to find the answer to the question of why some businesses can gain competitive advantages compared to businesses in the same industry based on analyzing the internal resources of the business (Wemerfelt, 1984). RBV suggests that organizations should focus on their internal strengths and focus on smart organizational management to achieve sustainable competitive advantage (King *et al.*, 2012).

Theory of competitiveness: Porter (1990) introduced the Diamond model with new concepts and explanations about competitive advantage. Instead of focusing on cost minimization in closed economies, today's competition is dynamic and is based on innovation and the search for strategic differentiation as countries are open their economies. Porter argues that four interconnected factors represent the significant competitive advantages of countries in specific industries, which include conditional factors of market demand, related supporting industries, strategy, and structure along with business competition. When applying the theory of competitive advantage to the seaport, the conditional factor is related to seaport facilities. The diamond model emphasizes the possible impact of a port's fundamental strengths and weaknesses on its competitive advantage, which also highlights the potential for competition and cooperation between port users and port service providers (Porter, 1985; Porter, 1998).

"Value Chain Model" theory: A value chain is a set of activities that an organization performs to create value for its customers. The value chains model can be used to examine activities and evaluate the degree of connection of these activities. Each business is a set of activities from design, production, sales to distribution and customer support. Each of these activities participates in a stage of the production process to convert inputs into outputs and create a certain value in the total value the business provides to customers. Porter calls them value activities and the set of business activities that form a value chain (Porter, 1985). Value chain theory is applied in this study is to serve as a basis for explaining the role of technology development (digital transformation) as a support activity in creating value for businesses and customers and the foundation to develop research hypotheses about the impact of digital transformation on businesses' competitive advantages.

"Knowledge-Based View" theory: "Knowledge-Based View" theory (KBV) views knowledge as the most important strategic resource and this is an extension of RBV (De Carolis, 2002). KBV views businesses as heterogeneous entities filled with knowledge (Hoskisson *et al.*, 1999). The RBV extension is considered appropriateto the current economic context (Grant, 1991; Drucker, 1993; Garud *et al.*, 2002; Mathews, 2003). This means that intangible resources are highly valued and considered important intellectual capital assets for businesses (Bontis *et al.,* 1999; Barney, 2001). According to Kogut and Zander (1992), all activities occurring in an enterprise require knowledge, which is the guiding principle for all enterprise activities. On the other hand, business performance will also be affected by how members of the business use knowledge to develop new products of higher quality (Grant, 1991). With a thorough comprehension of consumer demands, companies can develop products that consistently align with market requirements and enhance their production methodologies (Theriou et al., 2009). According to KBV theory, knowledge can be obtained from stakeholders external to the firm such as customers (Abrell *et al.*, 2016). Knowledge from customers is a knowledge resource that helps businesses in both operations and innovation (Cai *et al.*, 2022). Businesses frequently use such digital technologies to acquire knowledge and manage business relationships (Dehning *et al.*, 2003). Knowledge Source Theory is applied in this study, to explain the impact of customer participation on competitive advantage.

Institutional theory: North (1990) believes that different policy institutions will lead to different development results, and a good institutional environment will help businesses reduce transaction costs and improve business performance. Institutions/organizations are seen as the product of shared understandings and shared interpretations of acceptable norms of collective action, such as policies, practices, and job

titles (Parsons, 1956; Meyer and Rowan, 1977). Applying institutional theory to explain factors affecting digital transformation, and digital transformation impacts competitive advantage. Institutional theory is often used to understand organizational change related to the implementation of advanced technology by investigating factors and external pressures on organizational practices and culture (Adebanjo *et al*., 2018). Institutional theory views digital transformation as a fundamental institutional change that pervades and disrupts both sectors and organizations (Del Giudice *et al*., 2021, Hinings *et al*., 2018).

Resource Dependence Theory: Resource dependency theory (RDT) characterizes the enterprise as an open system, dependent on contingencies in the external environment. Resource dependence theory recognizes the influence of external factors that impact organizational behavior and that, although constrained by the context of that behavior, managers can act to reduce variance certain and dependent on the environment (Pfeffer and Salancik, 2003). Apply resource dependence theory to explain the impact of factors on digital transformation.

The above arguments relate to this research in explaining the nature of digital transformation and competitive advantages.

Digital transformation: Digital transformation is the use of new digital technologies to create major improvements in business (Fitzgerald *et al*., 2014). Digital transformation can be conceptualized as a disruptive process in which organizations change their value creation processes by applying digital technology in response to changes in the business environment (Vial, 2019). Digital transformation is considered a fundamental change created by digital technology, impacting and transforming entire organizations, business models, industries, and society. Digital transformation is firmly based on and supported by adopting digital technologies and replacing manual processes with digital ones, further integrating customers, suppliers and other parties related to business processes, building new ecosystems and creating shared value (Laorach and Tuamsuk, 2022; Robertsone and Lapina, 2023). It must be emphasized that digital transformation is not about a single technology, but about major changes based on the combination of information technology, computing, communications and connectivity (Bharadwajet *et al*., 2013; Swen and Reinhard, 2020) and digital transformation is the use of technology to radically improve the performance or reach of a business (Westerman *et al*., 2014). Digital transformation to change business models and create new opportunities, revenue and value, digital transformation in business involves moving from conventional business models to digital models, transforming digital is about rethinking how people, data, and processes organize to create new value (Ribeiro-Navarrete *et al*., 2020). Information technology capacity is an important and successful factor in implementing digital transformation

(Cichosz *et al*., 2020; Tijan *et al*., 2021; Jović *et al*, 2022; Luo, 2022; Zhang *et al*., 2023). Visionary digital leaders supported by competent, knowledgeable, and collaborative employees are critical to the success of digital transformation (AlNuaimi *et al*., 2022; Zhang *et al*., 2023). Flexibility in reallocating resources, reorganizing quickly (on the organizational level) and spotting innovation opportunities and seizing competitive market opportunities. In other words, organizational agility promotes digital transformation for businesses (AlNuaimi *et al*., 2021; Chu Ba Quyet, 2022; Gong and Ribiere, 2023; Ly, 2023). Competitive pressure stimulates businesses to find ways to increase competitiveness and maintain market share. Therefore, in the process of digital transformation, competition acts as a driving force in promoting the digital transformation of enterprises (Luo, 2022; Zhang *et al*., 2023).

Government financial support and incentives, develop financial subsidy and tax reduction policies for digital transformation of relevant enterprises, and develop relevant special plans to guide transformation Enterprise digital numbers can effectively encourage and guide businesses to carry out digital transformation. That shows that State policy is one of the important factors promoting the digital transformation of businesses (Luo and Yu, 2022; Le Xuan Cu and Ha Van Su, 2023). In this study, 05 components of digital transformation include as following: Information technology capacity, Digital leadership ability, organizational agility, Competitive pressure and Government support policy.

The impact of digital transformation on competitive advantage

Competitive advantage refers to the unique attributes, strategies, or assets that an organization or business possesses ownership, allowing them to outperform their competitors in a particular market (Farida and Setiawan, 2022). It makes the company more efficient, or more attractive to customersthan its competitive advantage is a key factor in achieving and maintaining a strong position in the competitive market (Arjang *et al.*, 2023; Saputra *et al*., 2023; Agustian *et al.*, 2023).

According to Agustian *et al.* (2023), digital transformation impacts the competitive advantage of all businesses. Many studies show that digital transformation positively affects product innovation and then impacts a competitive advantage (Abd Aziz and Samad, 2016; Udriyah *et al.,* 2019; Pantano *et al*., 2020; Almaazmi *et al*., 2020; Falahat *et al*., 2020; Bresciani *et al*., 2021; Shahid and Sheikh, 2021; Wongsansukcharoen and Thaweepaiboonwong, 2023; Li *et al.,* 2023; Chen and Kim, 2023).

According to Agustian *et al*. (2023), organizations strive to provide more personalized, fast and easily accessible services through digital platforms such as websites, mobile applications and social media. The use of data and customer behavior analytics becomes important in gaining competitive

advantage. Many studies show that digital transformation positively affects User Engagement and then impacts competitive advantage (Abrell *et al*., 2016; Carlson *et al*.,2018; Chen and Liu, 2020; Matarazzo *et al*., 2021; Xin *et al*., 2022; Zhao *et al*., 2023). Based on empirical studies, this study proposes the following hypotheses:

H1: Information Technology positively impacts the competitive advantage of businesses providing Logistic services.

H2: Digital transformation leadership positively impacts the competitive advantage of businesses providing Logistic services.

H3: Organizational agility leadership positively impacts the competitive advantage of businesses providing Logistic services.

H4: Competitive pressure positively impacts the competitive advantage of businesses providing Logistic services.

H5: Government support policy positively impacts the competitive advantage of businesses providing Logistic services.

3. RESEARCH MODEL
It is required to have a theoretical assessment and empirical study for further research to expand this theory and provide more empirical evidence and policy implications related to improving competitive advantage. Previous studies highlighted the factors that impact competitive advantage with qualitative analysis or measurement of relationships using quantitative models such as statistical testing, or separate regression models, but did not provide a complete basis for a comprehensive analytical framework on competitive advantage. Therefore, the purpose of this study is to extend the findings from previous ones and integrate analysis of their correlation into an exploratory factor analysis and linear regression modeling. The research teams selected a case to study Competitive advantage in Ho Chi Minh City logistic enterprises as shown in Figure 1.
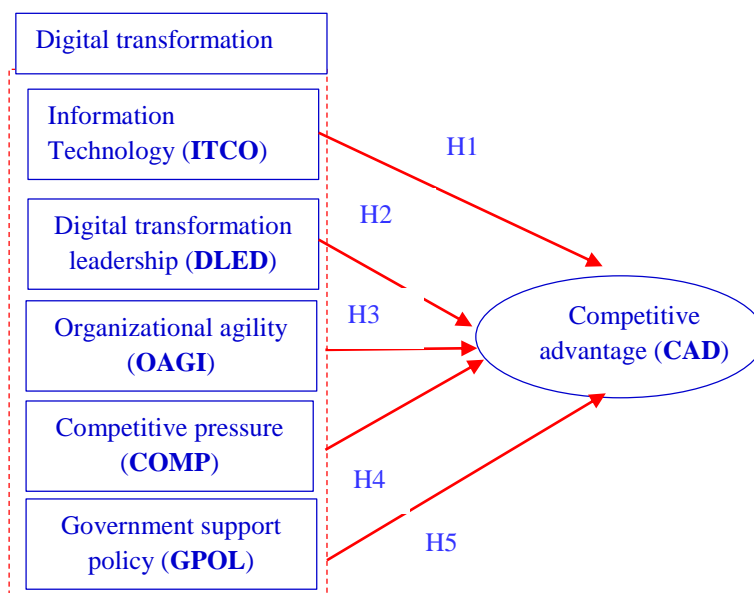

Figure 1: Theoretical research model

4. METHODOLOGY
Measurement: All existing scales have been adapted to better suit the specific research setting in Vietnam. We designed a three-step process for the survey. First, we carried out a survey using the expertise method of discussing with 10 port experts with at least five years of experience working at agencies related to the technology industry. They are leaders of departments and agencies in Ho Chinh Minh to refer to measuring scales and observation variables that are suitable for the logistics industry. Second, a pilot survey with 10 managers of the Logistics industry and 10 managers of Logistics companies in Ho Chi Minh City to verify if there were any errors in the questionnaire. The sample was selected

based on the respondents' willingness to participate in this study. Third, a complete survey was conducted for 400 people who are managers of Logistic companies in Ho Chi Minh City.

The five-point Likert scales starting from "strongly disagree" to "strongly agree" were used to measure all observation variables. To measure the "Information Technology" scale, 4 observation variables were included in the questionnaire. This scale is mainly based on research in Croatia by Jović *et al.* (2022). For "Digital transformation leadership", 4 observation variables were included in the questionnaire. It was mainly based on research in Thailand by Laorach and Tuamsuk (2022). For "Organizational agility" and

"Government support policy", 8 observation variables are included in the questionnaire. It is mainly based on research in the UAE by AlNuaimi *et al.* (2022). For "Competitive pressure", 4 observation variables were included in the questionnaire. It was mainly based on research in China by Zhang *et al.* (2023). For "Competitive advantage", 4 observation variables were included in the questionnaire. It was mainly based on research in China by Zhao *et al.* (2023). Scales were adjusted to suit the Vietnamese situation and had several new observation variables built by the authors from the expertise discussion results such as "The business's existing technology allows automating the service delivery process and upgrading to modern digital technologies"; "Business leaders are ready to accept digital transformation"; "The government has introduced several preferential policies for digital transformation businesses"; " Businesses quickly make decisions to face market and government changes"; "Over the past three years, the change in market share relative to the business's largest competitors has improved". Details of the scales are in the Appendix (Table A).

Data collection and processing: We launched a survey in Ho Chinh Minh City with 400 questionnaires. This survey lasted from June to September 2024. After data processing, 380 reliable observations were used for data analysis.

According to Fontaine (2005), the exploratory factor analysis modeling was performed in 4 steps: Reliability test of scale; Exploratory Factor Analysis (EFA); Confirmatory Factor Analysis (CFA), and Multiple variable regression. Data analysis was performed on SPSS and AMOS software version 21.0 (Thompson, 2004; Fontaine, 2005).

5. RESULTS

Descriptions of survey subjects

Table 1 shows the details of the questionnaire. Results showed that 79% were men. The ages were distributed across three groups: under 30, 31-45, 46–55, and over 55 with 20%, 56%, 16%, and 9%, respectively. Also, education levels in four groups: High school, College and University, Posgraduate, and Other, are 12%, 26%, 55%, and 9%, respectively. Occupation with four groups: Managers of domestic logistic enterprises, Managers of foreign logistic enterprises, Logistic authority officials, and Logistic experts are 54%, 32%, 8%, and 6%, respectively. Most survey objects are married (64%). The income of 30-50 million VND per month accounts for mainly (70%).

Table 1. Characteristics of survey subjects

	Frequency	%		Frequency	%
Gender			Income		
Male	301	79	<30	67	18
Female	79	21	30-40	139	37
Total	380	100	41-50	125	33
Ages			>50	49	12
<30	75	20	Total	380	100
31-45	211	56	Occupation		
46-55	60	16	Managers of domestic logistic enterprises	206	54
>55	34	8	Managers of foreign logistic enterprises	123	32
Total	380	100	Logistic authority officials	31	8
Education level			Logistic expert	20	6
Posgraduate	44	12	Total	380	100
Highschool	98	26	Marital status		
College & university	210	55	Single	37	36
Other	28	7	Married	63	64
Total	380	100	Total	380	100

Source: Extract research results from SPSS software, 2024.

Reliability analysis

Table 2. Scale reliability test and rejected observed variables.

No.	Scale	Observed variable are excluded	Alpha coefficients	Conclusion
1	ITCO	None	0.791	Quality
2	DLED	None	0.841	Good quality
3	OAGI	None	0.831	Good quality
4	COMP	None	0.836	Good quality
5	GPOL	None	0.831	Good quality
6	CAD	None	0.850	Good quality

Source: Extract research results from SPSS software, 2024.

The results in Table 2 showed that: The observed variables all satisfy the conditions in the reliability analysis of the scale through an alpha coefficient > 0.6, and a variable-total correlation > 0.3 (Nunnally and Burnstein, 1994).

Exploratory factor analysis

Table 3. Pattern matrix.

|	Component					
	1	2	3	4	5	6
DLED4	0.834					
DLED2	0.812					
DLED1	0.797					
DLED3	0.786					
COMP3		0.832				
COMP4		0.812				
COMP2		0.782				
COMP1		0.772				
GPOL3			0.811			
GPOL4			0.804			
GPOL2			0.787			
GPOL1			0.762			
ITCO4				0.807		
ITCO2				0.763		
ITCO3				0.758		
ITCO1				0.752		
OAGI2					0.824	
OAGI3					0.802	
OAGI1					0.788	
CAD3						0.859
CAD2						0.840
CAD4						0.831
CAD1						0.792
Kaiser-Meyer-Olkin Measure					0.813	0.813
Bartlett's test					0.000	0.000
Eigenvalues					1.677	2.761
% of Extracted variance					66.639	69.019

Source: Extract research results from SPSS software, 2024.

Note: 0.5 < KMO < 1; Bartlett's test has a significance level less than 0.05; Factor Loading of observed variables (Factor Loading) > 0.5; extracted variance > 50%, and Eigenvalue > 1 (Hair *et al*., 2006).

Table 4 shows that the factors of CAD are extracted into five factors corresponding to the measured variables of the theoretical model. The total variance extracted 66.639% at an Eigenvalue of 1.677; EFA of CAD is extracted into three observed variables with an extracted variance of 69.019% at an Eigenvalue of 2.761; and the Varimax rotation method used.

Confirmatory Factor Analysis
Confirmatory factor analysis aims to test the theoretical measurement model in accordance with practical data (Thompson, 2004).
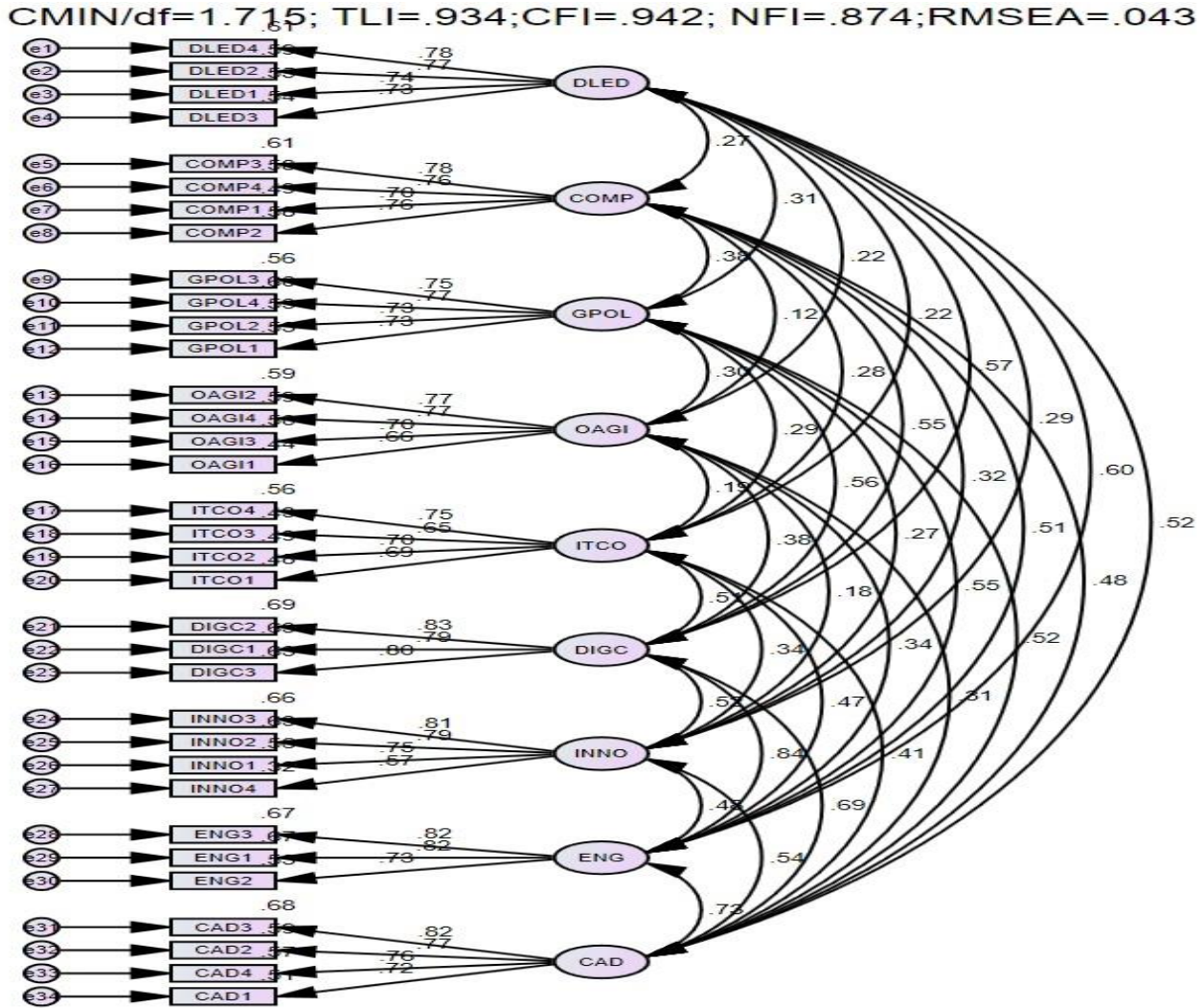
Figure 2: Confirmatory factor analysis
Source: Extract research results from AMOS software, 2024.

Table 4. shows that the measurement model is consistent with the actual data.

No.	Measures	Indicator Standard values	Model value	Results
1	Cmin/df	$\chi 2$/ d.f. < 3 good fit; < 5 accepted; the smaller the better (Bentler and Bonett, 1980; Bagozii and Jy, 1988)	2.175	Good
2	TLI (Tucker-Lewis Index)	TLI: the closer it is to 1, the more appropriate; TLI > 0.90 is consistent; TLI ≥ 0.95 is in good agreement (Hu and Bentler, 1995)	0.934	Good

3	CFI (Comparative Fit Index)	CFI > 0.90; 0 < CFI < 1, the closer to 1, the more suitable (Hu and Bentler, 1995).	0.942	Good
4	NFI (Normal Fit Index)	NFI, the closer it is to 1, the more suitable. NFI close to 0.90 is accepted; NFI > 0.95 is, a good fit (Chin and Todd, 1995; Hu & Bentler, 1995)	0.874	Accepted
5	RMSEA (Root Mean Square Error Approximation)	RMSEA < 0.05, the model fits well; RMSEA < 0.08, accepted; the smaller the better (Browne and Cudeck, 1993)	0.043	Good

Source: Extract research results from AMOS software, 2024.

Multivariate linear regression analysis

The scales of the measurement model are converted to quantitative variables

X_i = Mean (observed variables of the scale)

Thus, the regression model of the study has the form:

CAD = f (ITCO, DLED, COMP, OAGI, GPOL)

Regression analysis results

Table 5. Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-0.258	0.239		-1.080	0.281		
ITCO	0.203	0.047	0.181	4.301	0.000	0.904	1.106
COMP	0.237	0.047	0.216	4.999	0.000	0.856	1.169
DLED	0.283	0.045	0.267	6.280	0.000	0.885	1.130
GPOL	0.251	0.047	0.238	5.381	0.000	0.814	1.228
OAGI	0.118	0.045	0.110	2.625	0.009	0.916	1.092

Source: Extract research results from SPSS software, 2024.

Dependent Variable: CAD

In Table 5, with the t-student test, the independent variables have a statistically significant correlation with the PCOM dependent variable with the significance level ≤ 0.05 (Greene, 1991); Other tests include: adjusted R^2: 0.4, model interpretation level 40% (Hair *et al*., 2006); ANOVA: Sig. = 0.000, the regression model is suitable (Hair *et al*., 2006); VIF < 10, no collinearity; 1 < d = 1.217 < 3, no autocorrelation (Belsley *et al*., 1980). The study applied the Park test to consider the stability of residual variance (Park, 1966).
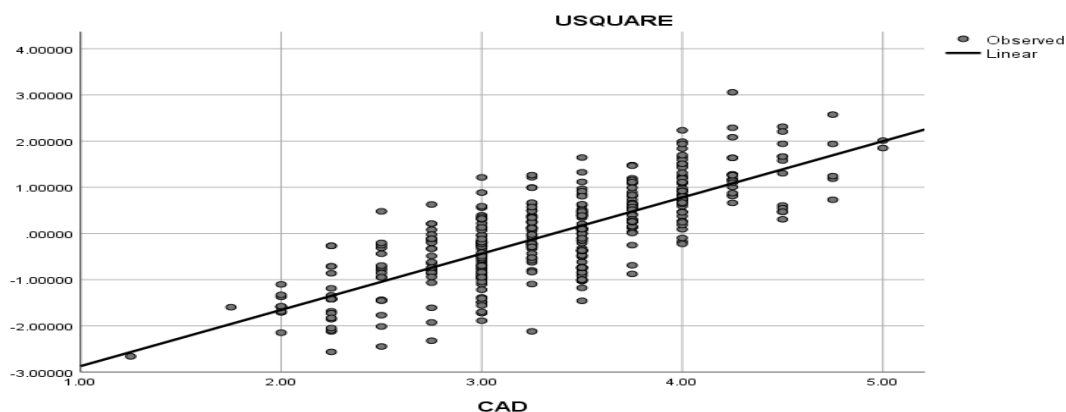
Figure 3: Park test
Source: Extract research results from SPSS software, 2024.

In Figure 3, the correlation curve is linear, with constant residual variance.

conclusion**:** Through 6 tests, factors affecting competiveness advanteges: ITCO, COMP, DLED, GPOL, and POAGI.

Table 5. Hypothetical results

Hypothesis	Impact			Beta	Sig.	%	Position	Decision
H1	CAD	<---	ITCO	0.181	0.000	17.9	4	Accepted
H4	CAD	<---	COMP	0.216	0.000	21.3	3	Accepted
H2	CAD	<---	DLED	0.267	0.000	26.4	1	Accepted
H5	CAD	<---	GPOL	0.238	0.000	23.5	2	Accepted
H3	CAD	<---	OAGI	0.110	0.009	10.9	5	Accepted
	Total			1.012		100		

Source: Extract research results from SPSS software, 2024.

The results presented in Table 5 show that all hypotheses are accepted at a confidence level of over 95%. Based on the standardized regression coefficient, Beta (Norusis, 1993), factors affecting Competitive advantage in order of influence: DLED (Digital transformation leadership), GPOL (Government support policy), COMP (Competitive pressure), ITCO (Information Technology Competency), and OAGI (Organizational agility).

Using BOOTSTRAP to analyze the reliability of LRM results.

Methods of CFA often require large samples (Anderson and Gerbing, 1988), whereas academic research is often limited in sample size. Bootstrap is a suitable alternative (Schumacker and Lomax, 2010). Bootstrap is an alternative, repeatable sampling method in which the original sample acts as a population. The Bootstrap method generates random samples from the original sample, which has numerous observations, often choosing 1,000 observations. The estimated results from N samples are averaged, and this value tends to be close to the estimate of the population. The smaller the difference between the average value of Bootstrap regression coefficients and the model estimate with the original sample, the more reliable the model estimates can be concluded.

Table 6. Bootstrap implementation results

Regression Weights: (Group number 1 - Default model)								
Parameter			SE	SE-SE	Mean	Bias	SE-Bias	*CR
DIGC	<---	DLED	0.044	0.001	0.403	0.001	0.001	1.0
DIGC	<---	COMP	0.056	0.001	0.386	0.001	0.002	0.5
DIGC	<---	GPOL	0.055	0.001	0.328	0.003	0.002	1.5
DIGC	<---	OAGI	0.050	0.001	0.198	0.000	0.002	0.0
DIGC	<---	ITCO	0.060	0.001	0.328	-0.003	0.002	-1.5
INNO	<---	DIGC	0.067	0.002	0.508	0.001	0.002	0.5
ENG	<---	DIGC	0.062	0.001	0.866	0.005	0.002	2.5
CAD	<---	DIGC	0.147	0.003	0.356	0.006	0.005	1.2
CAD	<---	INNO	0.072	0.002	0.205	0.002	0.002	1.0
CAD	<---	ENG	0.138	0.003	0.304	-0.003	0.004	-0.75

*CR (Critical Ratios) = (Bias) / (SE-Bias)

The absolute value of CR is less than or equal to 2, so it can be said that the bias is very small, the difference is not statistically significant at the 95% confidence level (Hair *et al.,* 2006). Regression coefficient results before Bootstrap are reliable with a confidence level greater than or equal to 95%. Table 6 shows regression coefficient results before Bootstrap was reliable.

6. DISCUSSION AND POLICY IMPLICATIONS

Our study has identified 5 factors affecting "Competitive advantage" and we sort them in descending significance order as follows: Digital transformation leadership, Government support policy, Competitive pressure, Information Technology Competency, and Organizational agility. This finding aligns with prior studies on the port sector in Croatia conducted by Jović and colleagues (2022), Thailand by Laorach and Tuamsuk (2022), the UAE by AlNuaimi *et al.* (2022), and China by Zhang *et al*. (2023).

We add new observation variables to the research on Competitive advantage, specifically "The business's existing technology allows automating the service delivery process and upgrading to modern digital technologies"; "Business leaders are ready to accept digital transformation"; "The government has introduced a number of preferential policies

for digital transformation businesses"; " Businesses quickly make decisions to face market and government changes"; "Over the past three years, the change in market share relative to the business's largest competitors has improved".

To improve Competitive advantage of Ho Chi Minh City Logistic enterprises, it is necessary to pay attention to 5 factors: Digital transformation leadership, Government support policy, Competitive pressure, Information Technology Competency, and Organizational agility. The Digital transformation leadership has the strongest and most obvious impact on Competitive advantage. This is beyond the capabilities of Logistic businesses but requires the Government's involvement in improving the level of digital technology applied in management of Logistic business managers. This is also a key factor for the development and capacity improvement of Ho Chi Minh City Logistic enterprises.

7. CONCLUSIONS AND RESEARCH LIMITATIONS

The current study aims to extend the theoretical framework and to provide evidence in empirical results that 5 factors impact competitive advantage, illustrated by the case of Ho Chi Minh City.

The findings highlight that Digital transformation leadership has the strongest and most significant impact on competitive advantage. Hence, this study provides some insights into the current research about factors affecting competitive advantage.

Besides its significant contributions, this study has some limitations. First, the subjects were drawn from only one city in Vietnam, which limits the external validity of this study. Future study should apply similar methods to cases of other cities, and to make comparisons to enhance the power of the findings. Finally, this study focuses on the 5 factors. Future studies can examine the effect of other factors on competitive advantage in Vietnam.

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Appendix

Table A. Measurement scale and observed variables.

No.	Scales and observed variables	Code
I	Information Technology Competency	ITCO
1	Enterprises implement measures to improve information security.	ITCO1
2	IT systems in businesses are interconnected.	ITCO2
3	The business has connected its IT system with systems operated by stakeholders.	ITCO3
4	The business's existing technology allows automating the service delivery process and upgrading to modern digital technologies.	ITCO4
II	Competitive pressure	COM
5	Business competitors have enhanced customer relationships through digital applications.	COM1
6	Competitors are using digital technology.	COM2

7	To stay ahead in the industry, businesses need to implement digital transformation.	COM3
8	Industry players have gone digital to gain a competitive advantage.	COM4
III	Digital transformation leadership	DLED
9	Business leaders have a good vision of digital transformation.	DLED1
10	Business leaders are interested in digital technologies and trying to apply them to their work processes.	DLED2
11	Business leaders are ready to accept digital transformation.	DLED3
12	Business leaders have the leadership ability and ability to build motivation to drive employee digital transformation.	DLED4
IV	Government support policy	GPOL
13	The government has initiated a number of plans to encourage businesses to digitally transform.	GPOL1
14	The government has established several related funds to support businesses in digital transformation.	GPOL2
15	The government has introduced several preferential policies for digital transformation businesses.	GPOL3
16	Applying digital transformation for businesses is the Government's top goal	GPOL4
V	Organizational agility	OAGI
17	Businesses can quickly respond to customer and supplier needs.	OAGI1
18	Businesses can quickly adjust operations and processes to meet fluctuations in demand.	OAGI2
19	Businesses can quickly resolve problems from suppliers and partners.	OAGI3
20	Businesses quickly make decisions to face market and government changes.	OAGI4
VI	Digital Conversion	DIGC
21	Businesses aim to digitize everything that can be digitized.	SCON1
22	Businesses aim to exchange information digitally.	SCON2
23	The business aims to create a powerful connection system through the integration of digital technologies into various business processes.	SCON3
VII	Innovation	INNO
25	Businesses are often the pioneers in bringing new services to market.	INNO1
26	Businesses regularly test new ideas.	INNO2
27	Businesses look for new ways to do things.	INNO3
28	Innovative businesses in new ways of operating.	INNO4
VIII	User Engagement	ENG
29	Businesses cooperate with customers to serve them better.	ENG1
30	Businesses interact with customers to jointly design services that meet their unique and changing needs.	ENG2
31	Businesses partner with customers to provide support systems to help customers get more value from the service.	ENG3
IX	Competitive advantage	CAD
32	In the past three years, the quality of the business's services is better than that of its competitors.	CAD1
33	Over the past three years, the change in market share relative to the business's largest competitors has improved.	CAD2
34	Over the past three years, the change in relative profitability of the business's largest competitors has improved markedly.	CAD3
35	Over the past three years, cost change relative to its largest competitor has decreased.	CAD4