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Applied Structure Equation Model for Policy Suggestions to Develop the Digital Economy in Vietnam

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Abstract

In the current context, promoting innovation in digital economic growth models associated with economic restructuring is a prerequisite for sustainable development. Therefore, the article aims to explore the critical factors influencing the digital economy and proposes policy recommendations for developing the digital economy. The study applies quantitative research methods mainly through actual data surveying of economic experts to evaluate factors affecting the digital economy based on the structural equation model to measure the digital economy in five big cities of Vietnam, including Hanoi, Hai Phong City, Da Nang City, Ho Chi Minh City, and Can Tho City. The data collection strategy involves direct interviews via a structured questionnaire, with a sample size of 800 economic experts, and analysis using SPSS version 20.0 and Amos software. The study's novelty identifies eight critical factors influencing the digital economy at a significance level of 0.01 and eight accepted hypotheses, including (1) Information technology and digital infrastructure, (2) Digital transformation capacity in businesses, (3) Government policies and laws, (4) Human resources, (5) Digital consumer needs and behavior, (6) E-commerce and financial technology, (7) International economic integration, and (8) Market. The findings highlight the significant influence of information technology and telecommunications infrastructure on Vietnam's digital economy. Finally, the authors proposed policy recommendations to enhance the digital economy; moreover, the digital economy is a way of doing business that relies on digital technology and data as its main inputs, operates mainly in a digital environment, and employs information and communication technologies to boost labor productivity, create new business models, and optimize economic structures. This model can be used by agencies, researchers, experts, and economic managers.

Keywords: Digital Technology, Policy Recommendations, Digital Economy, Economic Growth, Digital Transformation

1. Introduction

The digital economy is crucial to the socio-economy and is defined as an economy primarily driven by digital technologies, particularly electronic transactions conducted over the Internet. The digital economy encompasses all domains in which digital technology is utilized. At a macro level, the digital economy has facilitated the integration of Vietnamese firms into the global technology chain and generated significant economic value to advance national development. Therefore, it is necessary to recognize the role of the current status of the digital economy and the issues raised. The role of the digital economy can be identified from many different perspectives [1]. The presence of the digital economy can be seen in all areas of life, such as providing transportation sharing services, accommodation, online shopping, using e-wallets, car and motorbike calling applications, goods delivery, booking airline tickets, ordering food, renting rooms, swiping cards to pay when buying goods at stores [2], [3].

In addition, some industries have low digitalization activities, such as veterinary activities, social assistance activities, centralized care and nursing activities, tobacco product manufacturing, pollution treatment, and other waste management activities, accounting for about 0.002% of the total added value of the digital economy. The proportion of added value of the digital economy in GDP of industry groups in 2020-2023. Accordingly, the proportion of the added value of the digital economy in the GDP of the service industry group accounts for the most significant proportion and tends to increase over the years; the corresponding proportion of the industry-construction industry

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group is the second highest but tends to decrease in the past two years; the agriculture, forestry, and fishery industry group is still at a deficient level. The reporting shows the proportion of the added value of the digital economy in total GRDP by province and centrally-run city from 2020 to 2023. Accordingly, out of 63 provinces and cities, 5 provinces and cities have a proportion of over 20%; 8 provinces and cities have a proportion of 10-20%; 48 provinces and cities have a proportion of 5-10%; 2 provinces and cities have a proportion of less than 5%.

The challenges to digital economic development: (1) The digital economy is a new, advanced, and complicated issue for many levels and professions, so cognitive thinking problems are inevitable. Propaganda work has been done regularly, continuously, and on a large scale, not only at the central level but also at the provincial, district, and grassroots levels, but it needs to be more specific and practical. The major challenge is that the legal and institutional environment of digital economic development is incomplete and unsynchronized. The goal focuses on production (added value), but little is mentioned about labor, investment capital, enterprises, profit margins, etc. (2) the infrastructure serving the digital transformation process is still limited. Not only is it limited in terms of facilities, including databases and transmission lines, but more importantly, it is also very fragmented, with minimal connectivity and communication. Although it is a public asset, it is divided among many ministries, branches, provinces, districts, communes, and human resources, especially information technology human resources, which are limited in quantity and not guaranteed in quality, with some people being purely specialized the number of domestic enterprises is still tiny and weak, access is limited. Foreign enterprises have strengths in information technology, but the spread to the domestic area is still limited. The cash economy is still significant. Although the proportion of cash in circulation outside the banking system in total means of payment has decreased, it is still high. Therefore, the paper determines critical factors affecting the digital economy and provides policy implications for the short- and long-term digital economy.

2. Literature Empirical Review and Hypothesis Development

2.1. Digital Economy (DE)

The term "digital economy" refers to the interconnected web of monetary and non-monetary transactions that have their foundation in the Internet. In addition, all economic activities that use digital technology are encompassed in the digital economy [4]. This includes services, agriculture, manufacturing, transportation, logistics, banking, and all production, distribution, circulation, and purchase areas. All sectors and industries with digital technology-related business models are part of the digital economy [5]. This includes new and old sectors integrating digital technology into their operations and production processes. In particular, digital technology is advanced information and communication technologies and tools to amplify productivity.

2.2. Information Technology and Digital Infrastructure (IT)

Telecommunications and broadband infrastructure are central, providing high-speed Internet connections supporting online services and e-commerce. Server systems and data centers: Data centers store and process data for businesses and individuals [6]. Cloud computing services allow companies to use remote resources without investing in their infrastructure. Mobile devices and Internet of Things (IoT) based on intelligent internet-connected devices, such as smartphones, tablets, and IoT devices, enhance interactivity and collect real-time data accurately [7]. Blockchain and AI are modern infrastructure technologies that support information security, storage, and processing and improve digital transactions' transparency and efficiency [8]. Information technology and digital infrastructure are the most basic and essential elements for developing digital services, products, and applications and creating favorable conditions for digital transformation in all areas of the economy. Thus, the authors gave hypothesis H1 in figure 1.

2.3. Digital Transformation Capacity in Businesses (DT)

Enterprises with solid capabilities can create added value for consumers through intelligent and modern products and services. Strong businesses can strengthen networks and expand business activities, creating new job opportunities and contributing to economic growth [9]. Enterprises with solid capabilities can create digital products and services, essential in promoting digital economic development during the 4.0 Industrial Revolution [10]. In summary, business capabilities are indispensable in digital economic development, contributing to maintaining and enhancing business competitiveness in the digital and global markets. Thus, the authors gave hypothesis H2 in figure 1.

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2.4. Government Policies and Laws (GP)

Government policies not only provide legal support but also create motivation for the process of digital transformation and digital economic development. Some crucial policies include digital infrastructure development policy based on the Government often plays a leading role in developing digital infrastructure, such as telecommunications networks, broadband systems, and national data centers [11]. Investing in 5G, IoT, and cloud computing technologies is central to many countries' digital infrastructure development strategies. Policies to encourage innovation by policies to support research and development (RandD), along with encouraging businesses to innovate, help promote the digital transformation process [12]. The Government can provide financial support, tax incentives, and technology investment funds to encourage businesses to adopt new technology. To take full advantage of the benefits of the digital economy and digital transformation, the Government needs to regularly update and improve laws and policies. This helps create a favorable business environment, protect consumer rights, and promote sustainable development of the economy [13]. The Government also needs to cooperate with experts, businesses, and international organizations to develop regulations appropriate to the realities and requirements of the digital age. Thus, the authors gave hypothesis H3 in figure 1.

2.5. Human Resources (HR)

Highly skilled human resources and solid professional qualifications help businesses optimize operations, minimize errors and waste, and improve product and service quality [14]. Promoting sustainable development based on human resources capable of adapting to change and facing new challenges, especially in the digital economy and the 4.0 industrial revolution, is a critical factor for the sustainable development of businesses and the economy [15]. Management and administration: Competent leaders and managers will help guide strategy, develop resources, and build organizational culture to achieve long-term goals. Thus, the authors proposed the final hypothesis H4 in figure 1.

2.6. Digital Consumer Needs and Behavior (DC)

E-commerce has become popular, and platforms like Shopee, Lazada, Amazon, and other online sales websites have become popular. Consumers can easily compare prices, evaluate quality, and choose payment methods online. Smooth user experience based on the need for an easy-to-use, intuitive interface and smooth experience on digital platforms is a decisive factor in customer satisfaction [16]. This includes site navigation, page load speed, and quick search capabilities. Personalization of products and services based on digital consumers expect products and services personalized to their preferences and habits [17]. Intelligent recommendation systems and customized promotions create a fun and engaging shopping experience. Digital consumer behavior and needs are evolving rapidly and strongly affecting how businesses reach and serve customers. Grasping this trend will help companies to meet market needs and create competitive advantages in the digital economic age. Thus, the authors gave hypothesis H5 in figure 1.

2.7. E-commerce and Financial Technology (EF)

Online Lending by P2P (peer-to-peer lending) and online lending platforms such as Funding Circle, Prosper, and Lenddo help connect borrowers with investors, reducing dependence on traditional financial institutions and facilitating quick lending at reasonable interest rates [18]. E-commerce refers to buying and selling products or services online through digital platforms. The Internet and digital technology development has turned e-commerce into one of the fastest-growing industries globally. Business-to-consumer is the most popular form, in which businesses sell products and services directly to consumers through websites or applications [19]. For example, Amazon, Shopee, and Lazada. B2B (Business-to-Business): Businesses transact and provide products and services to other businesses through e-commerce platforms. Alibaba is a typical example of this model. Fintech and e-commerce will continue to grow and converge thanks to the advancement of technologies such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT). Consumers will have a smoother, more personalized shopping and payment experience, and businesses will find new opportunities to expand and grow in the digital world. Thus, the authors gave hypothesis H6 in figure 1.

2.8. International Economic Integration (IE)

Nonetheless, trade policies with non-regional countries are still up to each country. AFTA, or the ASEAN Free Trade Agreement. When trade barriers are removed, trade allows businesses to access international markets more efficiently, promoting exports and imports [19]. This helps countries optimize their comparative advantage and enhance global

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competitiveness. Common Market: This is the next step in development, where not only goods but also services, labor, and capital move freely between member countries [20]. The expected market requires countries to harmonize their domestic economic policies to ensure closer economic integration. In the future, international economic integration is expected to grow with the expansion of multilateral and bilateral trade agreements and the rise of technology and digital trade. However, global instability, trade conflicts, and climate change issues can cause significant impacts on the economic integration process. Thus, the authors gave hypothesis H7 in figure 1.

2.9. Market (MA)

Services such as online education, remote health care, and digital entertainment services are increasingly growing, opening up great opportunities for businesses providing these services. This is especially true as demand for digital services surges after the Covid-19 pandemic. Enhancement and innovation based on digital platforms provide opportunities for businesses and organizations to collaborate, exchange information, and innovate [20]. Technology like blockchain helps secure information and enhances transparency and efficiency in economic transactions. With the rapid development of technology and increasing consumer demand, the digital economy is expected to expand in the coming years. Trends such as artificial intelligence, augmented reality (AR), blockchain, and automation will continue to shape the future of this market. At the same time, innovations in e-commerce, digital finance, and IoT will continue to open up many growth opportunities globally. Thus, the authors gave hypothesis H8 in figure 1.

Based on the information provided, the authors have put forth a particular study model in figure 1.

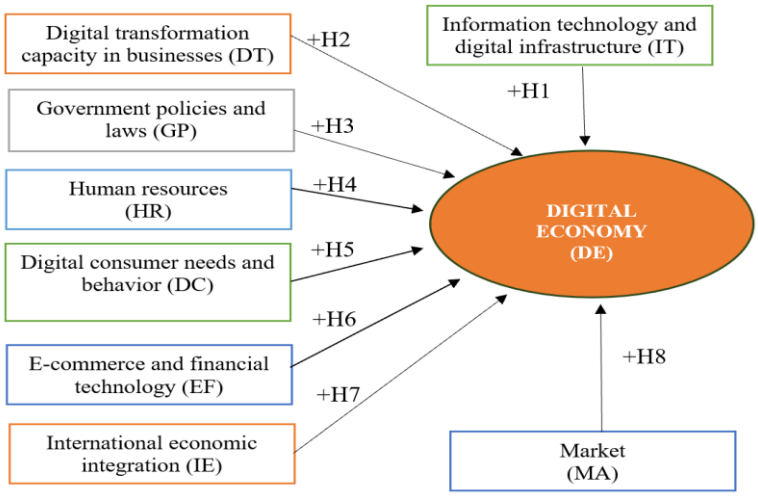

Figure 1. A research model for critical factors affecting the digital economy

Figure 1 shows eight independent factors influencing digital economy in Vietnam: (1) Information technology and digital infrastructure (IT), (2) Digital transformation capacity in businesses (DT), (3) Government policies and laws (GP), (4) Human resources (HR), (5) Digital consumer needs and behavior (DC), (6) E-commerce and financial technology (EF), (7) International economic integration (IE), and (8) Market (MA). Besides, figure 1 also shows that the dependent factor is the digital economy (DE).

3. Methodology and Data

A driving force behind innovation, a game-changer for whole industries, and a fundamental architect of modern society, the digital economy has quickly become an indispensable component of international progress. The digital economy has tremendous promise for helping Vietnam achieve long-term economic growth and become more competitive internationally. Based on research in five major cities across Vietnam, this essay delves into the elements shaping the country's digital economy, drawing attention to their significance and offering concrete suggestions for policy change. Thus, the researchers in this study used quantitative methods to catalog and examine the most critical aspects of Vietnam's digital economy, and ten methodical steps were used to perform the research. This article consists of ten steps for finding out the essential factors affecting the digital economy: Step 1: Identify research problem and framework development by finding the research problem and develop a conceptual framework based on theories of the

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digital economy. This step involves three analyses: (a) establishing a theoretical framework for digital economy concepts, (b) examining interconnections among the concepts, and (c) formulating a preliminary scale for factors influencing the digital economy. Step 2: Qualitative research and hypothesis formulation by conducting in-depth qualitative research through interviews with economic experts to define initial scales and hypotheses. This phase involves gathering real-life insights to construct the preliminary structure for analysis. Step 3: Develop conceptual measurements using insights from qualitative research and conduct group discussions with nine corporate managers across various regions in Vietnam. This includes interviews with 30 economic experts to refine the initial concepts and gather expert recommendations on digital economy policies [21]. Step 4: Refine scale and modify variables by enhancing the initial scale through additional focus group discussions, refining variables based on qualitative analysis. This step uses expert feedback to alter the scale, creating a robust basis for further quantitative testing. Step 5: Primary data collection using surveys by distributing a structured Likert-scale questionnaire to participants, ranging from "strongly disagree" (level 1) to "strongly agree" (level 5), to gather primary data on the relevance of each factor impacting the digital economy. Step 6: Pilot quantitative research and initial data analysis by conducting an initial quantitative analysis with a sample size of 800 participants from five major cities in Vietnam, including Ho Chi Minh City, Can Tho, Hai Phong, Da Nang, and Hanoi. Use Exploratory Factor Analysis (EFA) for initial calibration and Cronbach's alpha to assess scale reliability, removing variables with a correlation below 0.3. Step 7: Advanced quantitative data collection and reliability testing by engaging in a full-scale data collection process across the same five urban centers with a refined sample size of 800 economic experts, utilizing probability sampling. After data entry and cleaning, SPSS and AMOS software were applied for advanced data analysis, reassessing scale reliability with Cronbach's alpha [21]. Step 8: Comprehensive scale validation by validating the conceptual scale through both EFA and Confirmatory Factor Analysis (CFA), ensuring that each variable's reliability and structural alignment meet established criteria. This validation process is vital for establishing the scale's applicability across multiple contexts [21]. Step 9: Model testing with structural equation modeling (SEM) by conducting SEM analysis, which includes CFA, to assess the validity of the scales, examining the model's goodness of fit. Analyze the relationship among various factors to confirm the model structure and accurately depict the digital economy's influencing elements [21]. Step 10: Conclusion and policy implications based on model findings, outline research conclusions, and propose targeted policy recommendations for enhancing the digital economy. Summarize the results and identify impacts on governance, offering insights for strategic growth in Vietnam's digital sector.

4. Empirical Results

4.1. Analysis of Descriptive Statistics and Cronbach's Alpha for Factors Affecting the Digital Economy

Table 1 shows the effects of nine variables on Vietnam's digital economy, including eight independent variables and one dependent variable, digital economy (DE). Means, standard deviations, and Cronbach's alpha are used to evaluate these parameters. The internal consistency of the assessment items for each factor is shown by Cronbach's alpha, while the central tendency and variability of responses are illuminated by the mean and standard deviation. In addition, the reliability of descriptive statistics and measurement scales are successfully highlighted in this analysis, providing a solid basis for future quantitative analyses. If there is anything in table 1 below that needs more explanation below.

Table 1. Testing descriptive statistics and Cronbach's alpha for the digital economy

Items	Cronbach's alpha	Mean	Std. Deviation
Information technology and digital infrastructure (IT: IT1, IT2, IT3, IT4)	0.959	3.087	3.087
Digital transformation capacity in businesses (DT: DT1, DT2, DT3, DT4, DT5)	0.868	2.404	0.688
Government policies and laws (GP: GP1, GP2, GP3)	0.944	3.345	0.967
Human resources (HR: HR1, HR2, HR3, HR4)	0.962	3.069	0.986
Digital consumer needs and behavior (DC: DC1, DC2, DC3, DC4)	0.954	3.394	0.921
E-commerce and financial technology (EF: EF1, EF2, EF3, EF4)	0.950	3.057	0.977
International economic integration (IE: IE1, IE2, IE3, IE4)	0.951	3.054	0.987

Market (MA: MA1, MA2, MA3, MA4)	0.874	2.394	0.676
Digital economy (DE: DE1, DE2, DE3)	0.946	3.355	0.965

Table 1 tests the reliability of the scale, including eight independent factors: (1) Information technology and digital infrastructure, (2) Digital transformation capacity in businesses, (3) Government policies and laws, (4) Human resources, (5) Digital consumer needs and behavior, (6) E-commerce and financial technology, (7) International economic integration, and (8) Market. Table 1 shows that Cronbach's alpha for critical factors affecting the digital economy is higher than 0.7. Table 1 displays the descriptive statistics and Cronbach's alpha coefficients for factors associated with the digital economy. Each construct has multiple items, with Cronbach's alpha reflecting internal consistency, while the mean and standard deviation characterize the distribution of responses.

Moreover, eight variables impacting Vietnam's digital economy were tested for hypotheses, and the results are shown in table 2. Using standardized estimates, critical ratios (CR), p-values, and standard errors (SE), we examine the correlations between the independent factors and the dependent variable. At the 0.01 level of significance, the data validate all hypothesized associations. The most influential sectors in the digital economy are information technology and digital infrastructure (IT) and digital infrastructure, which has the highest standardized estimate at 0.529. This demonstrates how important it is to have a solid information technology infrastructure, such as a fast internet connection and sophisticated communication networks, to fuel the expansion of the digital economy. Table 2 below presents evidence-based policy suggestions for improving Vietnam's digital growth, and this thorough research concludes by shedding light on the crucial aspects impacting the digital economy.

Table 2. Testing critical factors affecting the digital economy

Relationships			Standardized estimate	S.E	C.R	P value	Result
DE	←	IT	0.529	0.030	16.382	***	Accepted H1
DE	←	DT	0.085	0.048	2.741	0.006	Accepted H2
DE	←	GP	0.090	0.034	3.174	0.002	Accepted H3
DE	←	HR	0.081	0.025	2.782	0.005	Accepted H4
DE	←	DC	0.175	0.033	5.306	***	Accepted H5
DE	←	EF	0.092	0.026	3.047	0.002	Accepted H6
DE	←	IE	0.085	0.031	2.625	0.009	Accepted H7
DE	←	MA	0.079	0.053	3.651	***	Accepted H8

Note: *** with 1%.

Table 2 shows eight factors affecting the digital economy, with a significance level of 0.01. The article's novelty is finding out that information technology and digital infrastructure have the most substantial impact on the digital economy in Vietnam, with a standardized estimate of 0.529. Table 2 displays that information technology and digital infrastructure are the most critical factors driving the digital economy, followed by consumer needs and behavior. Factors like government policies, human resources, E-commerce and Fintech, international economic integration, and Market also play significant roles, though their effects are more moderate.

Moreover, the connections between the eight independent and dependent variables were examined in the SEM study, as shown in figure 2. Several model fit indices, including RMSEA, GFI, TLI, and Chi-square/df, confirm that the model is adequate. The measures show that the hypothesized correlations of the factors are held up in figure 2 below.

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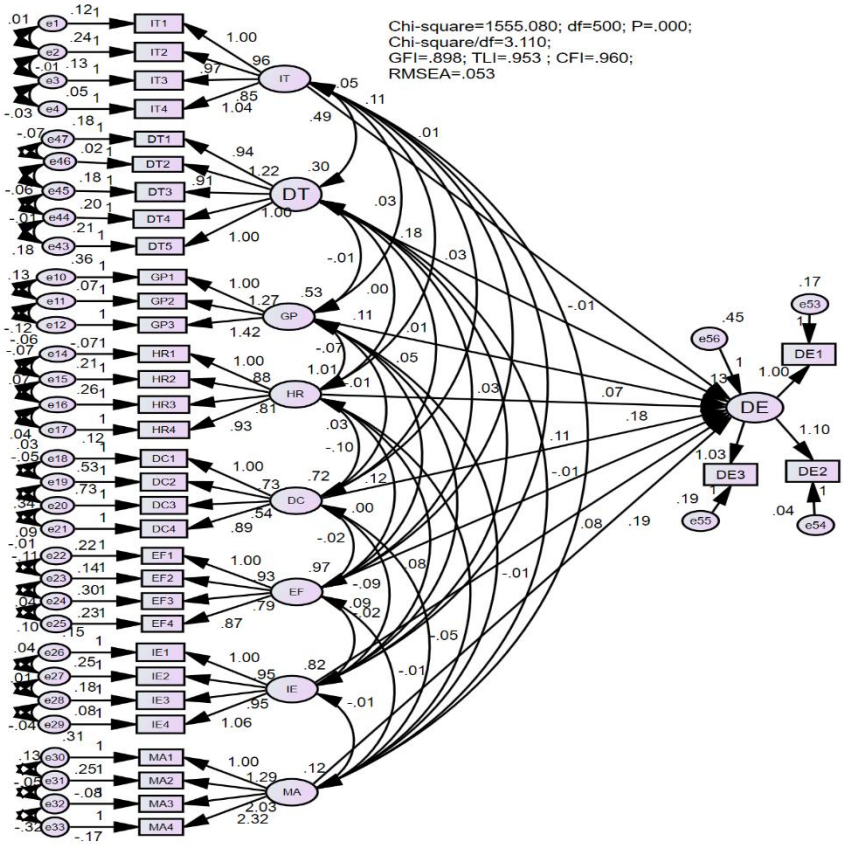

Figure 2. Testing for various factors affecting digital economy (ED)

Figure 2 shows that the assessment of the critical factors affecting the digital economy: CMIN/DF = 3.110 (<5.0), GFI = 0.898 (>0.800), TLI = 0.953 (>0.900), CFI = 0.960 (> 0.900) and RMSEA = 0.053 (<0.08). The study aims to determine the eight factors affecting the digital economy in Vietnam, especially the fiscal policy's most substantial impact on the digital economy in Vietnam, with a standardized estimate of 0.487, which is the most important.

Moreover, table 3 shows the outcomes of a Bootstrap Analysis with 60,000 resamples, which gives substantial estimates of the links between the digital economy and eight critical parameters. The Bootstrap approach verifies that the parameter estimations are stable and reliable by looking at each factor's mean, SE, bias, and SE bias. In addition, all eight of the elements impacting the digital economy have been validated by the Bootstrap analysis, proving their significance and reliability. While pointing out opportunities for growth in areas like human resources and global integration, the results stress the importance of information technology, digital consumer behavior, and market dynamics. Insights like these should guide policymakers as they craft plans to encourage digital growth in Vietnam.

Table 3. Testing Bootstrap 60.000 samples for factors affecting the digital economy

Parameter			SE	SE-SE	Mean	Bias	SE-Bias	Result
DE	←	IT	0.042	0.000	0.491	0.001	0.001	1.00
DE	←	DT	0.049	0.000	0.132	0.001	0.001	1.00
DE	←	GP	0.039	0.000	0.098	0.009	0.005	1.80
DE	←	HR	0.026	0.000	0.069	0.001	0.003	0.33
DE	←	DC	0.041	0.000	0.169	0.007	0.004	1.75
DE	←	EF	0.026	0.000	0.072	0.008	0.005	1.60
DE	←	IE	0.035	0.000	0.081	0.001	0.003	0.33
DE	←	MA	0.049	0.000	0.185	0.007	0.004	1.75

Table 3 exhibits Bootstrap testing with 60.000 samples to investigate factors influencing the digital economy at a significance level of 0.01. This finding is entirely consistent with Vietnamese applied economic theory and practice principles. This outcome provides policymakers with scientific evidence to consult and make informed predictions.

4.2. Result Discussion

The eight factors influencing the digital economy highlight the need for a multi-dimensional policy approach. Investments in digital infrastructure, regulatory reforms, human resource development, and market incentives are critical to fostering a thriving digital economy. Governments should collaborate with the private sector to create an enabling environment that promotes digital innovation, enhances consumer confidence, and ensures inclusive growth. By implementing these specific policy recommendations, governments can create the conditions necessary for sustainable development and global competitiveness in the digital age: (1) Accepted H1: Information technology and digital infrastructure (IT) significantly affect the digital economy based on the estimate of 0.529, p = 0.000 in table 2 [22]. Investment in high-speed Internet and telecommunication infrastructure, such as governments should prioritize expanding high-speed internet access and improving telecommunication coverage, particularly in rural and underserved areas. (2) Accepted H2: Digital transformation capacity in businesses (DT) has a modest yet significant effect based on the estimate of 0.085, p = 0.006 in table 2 [23]. Support for SME digitalization: Governments should provide targeted support to small and medium-sized enterprises for digital transformation, including grants, low-interest loans, and training programs focused on digital adoption. Create digital transformation advisory centers to assist businesses in adopting cutting-edge technologies such as AI, IoT, and blockchain. (3) Accepted H3: Government policies and laws (GP) positively impact the digital economy based on the estimate of 0.090, p = 0.002 in table 2 [24]. Governments should develop a comprehensive legal framework that covers critical areas such as data protection, cybersecurity, intellectual property rights, and digital transactions. This framework should be aligned with international standards to ensure trust in the digital economy. (4) Accepted H4: Human resources (HR) contribute to the digital economy based on the estimate is 0.081, p = 0.005 in table 2 [25], [26]. Develop a National digital skills agenda by implementing nationwide programs to improve digital literacy and skills, focusing on current workers and students. (5) Accepted H5: Digital consumer needs and behavior (DC) play a significant role based on the estimate of 0.175, p = 0.000 in table 2 [25], [27]. Consumer awareness programs can be launched by launching campaigns that increase consumer awareness about digital services, their benefits, and how to securely use them. This will help build confidence in the digital economy, especially regarding online transactions and data privacy. (6) Accepted H6: E-commerce and financial technology (EF) influence the digital economy based on the estimate is 0.092, p = 0.002 in table 2 [28]. Digital payment infrastructure encourages the development of a robust digital payment infrastructure by promoting cashless transactions through mobile banking, e-wallets, and other fintech solutions. The Government can introduce incentives for consumers and merchants who adopt digital payment methods. (7) Accepted H7: International economic integration (IE) is a positive factor based on the estimate is 0.085, p = 0.009 in table 2 [29], [30]. Bilateral and multilateral digital trade agreements encourage international economic integration by negotiating bilateral and multilateral agreements that facilitate digital trade, data flow, and e-commerce. Such contracts should focus on reducing tariffs and regulatory barriers for digital services and promoting technology sharing across borders. (8) Accepted H8: Market (MA) also significantly affects the digital economy based on the estimate of 0.079, p = 0.000 in table 2 [31]. Creating a digital innovation hub by establishing digital innovation hubs or technology parks to support the growth of digital technology start-ups, research, and product development.

5. Conclusions and Policy Recommendations

5.1. Conclusions

The structural equation model assesses the digital economy in five major cities of Vietnam: Hanoi, Hai Phong, Da Nang, Ho Chi Minh City, and Can Tho. The data-gathering technique entails direct interviews with a standardized questionnaire, including a sample size of 800 economic experts, and an analysis conducted using SPSS version 20.0 and Amos software. The study's originality identifies eight pivotal factors affecting the digital economy at a significance level of 0.01 and eight validated hypotheses. The rise of the digital economy is not just a passing trend; it is a powerful force altering people's daily lives, including their jobs, relationships, and spending habits. The digital economy has pushed Innovation and transformation, which has seen the advent of the Internet, artificial intelligence,

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and blockchain. The significance of grasping and comprehending the digital economy's trends, challenges, and opportunities becomes even more apparent in this context. With a significance level of 0.01 and eight hypotheses accepted, the article concludes that the following elements influence the digital economy. Its uniqueness draws attention to the fact that Vietnam's digital economy heavily relies on IT and telecom infrastructure. The State and the business sector must work together to foster good outcomes from influencing variables and accelerate the digital economy's development. Executing a wide range of suggestions based on the abovementioned points is necessary to promote beneficial effects from elements influencing the digital economy. When it comes to advancing Vietnam's digital economy, each suggestion plays a significant role. Because of this, to increase the quality of Vietnam's digital economic development now and in the future, it is crucial to fully understand and simultaneously adopt suggestions from the state and companies.

5.2. Policy Recommendations

The study finds eight essential factors influencing the digital economy with a significance level of 0.01 and eight acceptable hypotheses. The uniqueness emphasizes the enormous impact of information technology and telecommunications infrastructure on Vietnam's digital economy. To achieve the ambitious growth objective sanctioned by the National Assembly, it is necessary to focus on the implementation of specific policies targeted at capitalizing on opportunities and resolving problems, as indicated below:

(1) The results from table 2 indicate that information technology and digital infrastructure (IT) exhibits a standardized estimate of 0.529 and a p-value of 0.000, confirming its critical role in driving the digital economy. Vietnam must continue investing in and expanding its digital infrastructure to remain competitive in the global digital landscape. In the coming time, the State must thoroughly implement essential infrastructure development policies such as deploying high-quality broadband nationally. Encourage private enterprises with sufficient capacity to participate in building telecommunications infrastructure and other infrastructure for national digital transformation. To implement this policy, the study proposes the following solutions by investing in infrastructure: Upgrade the national fiber optic network, connecting all provinces, cities, and rural areas; Support telecommunications businesses to deploy 5G networks nationally; Encourage private investors to participate in the telecommunications sector.

(2) The findings also highlight that digital consumer needs and behavior (DC) has a standardized estimate of 0.175 with a p-value of 0.000, underscoring its considerable influence on the digital economy. Vietnam should, therefore, prioritize understanding and adapting to consumer preferences in the digital realm to accelerate growth in this sector. The State should prioritize enacting regulations that encourage commerce and service activities shortly if it wants to boost consumer demand in the 4.0 era by advocating for and supporting domestic consumption and trade promotion initiatives. Encourage the new domestic market development project linked to the Campaign "Vietnamese people prioritize using Vietnamese goods" to be implemented. Encourage SMEs to launch cutting-edge new ventures and participate in value chains and clusters in their respective industries.

(3) E-commerce and financial technology (EF) record a standardized estimate of 0.092 and a p-value of 0.002, indicating a significant positive impact on the digital economy. Vietnam must foster innovation in e-commerce and financial technologies to support a more integrated and efficient digital marketplace. In the business context of the digital economy, with changes in consumer shopping behavior, retailers need to aim for some solutions to maintain and manage good customer relationships. Methods to attract new customers, retain current customers, and increase the loyalty of traditional customers are as follows: (i) Businesses need to provide accurate and updated information. Enhance customer experience with applications that combine virtual reality, three-dimensional images, and mobile devices. The development of intelligent technology, artificial intelligence, creates the basis for personalizing the response to customer needs at different levels in every stage of the contact process and every channel connecting with customers. (ii) Businesses need to ensure the safety of customers' personal information, regularly reviewing the system's security level to prevent risks. Consumer information in the digital age is not limited to nominal content, such as full name, address, phone, and personal financial information, but also describes behavior and tracks how consumers think, choose, and transact.

(4) Government policies and laws (GP) show a standardized estimate of 0.090 and a p-value of 0.002, highlighting the pivotal role of regulatory frameworks in shaping the digital economy. If Vietnam wants to foster digital transformation

and innovation, it must fortify its policy and legal frameworks. The state must set explicit policies to use the chances given by the Fourth Industrial Revolution to progress the digital economy. When conducting context analysis for medium- and long-term development plans, including the possibilities and threats of the Fourth Industrial Revolution is crucial. This is especially true regarding massive infrastructure investment programs, especially in the IT, ICT, and Internet sectors. Because of the magnitude of the effects, businesses and government agencies must raise their level of understanding, especially in the energy, resource extraction, and industrial sectors. The banking sector must be educated on the Fourth Industrial Revolution to reduce the likelihood of poor investments and future bad debts to help businesses and investors change their plans. Enhance technology absorption capacity and foster innovation: advocate for forming industry clusters; prioritize public investment in infrastructure development to improve connectivity.

(5) International economic integration (IE), with a standardized estimate of 0.085 and a p-value of 0.009, reflects the importance of global economic engagement. Vietnam should continue to enhance its international collaborations and partnerships to boost its digital economy through cross-border opportunities and knowledge exchange. Vietnam continues completing policies to improve the effectiveness of international economic integration, which is essential for the sustainable development of the economy in general and the digital economy in Vietnam. These policies are as follows: Strengthen research and forecast issues of international economic integration. Relevant ministries, branches, and agencies focus on researching strategic matters of international economic integration to serve as a basis for advising and advising the Government in the policy-making process on economic integration. International economy, such as the impact of participating in new generation FTAs, protectionist trends, and the risk of trade wars affecting our country's economy, the trend of shifting the focus of cooperation in regional and world. State authorities must conduct detailed dissemination and promotion operations about new-generation FTAs, ensuring the content is realistic, succinct, and suitably aligned with the preferences of each distinct company's target demographic.

(6) The standardized estimate for digital transformation capacity in businesses (DT) is 0.085, with a p-value of 0.006, showing a moderate but essential influence on the digital economy. Vietnamese enterprises should accelerate their digital transformation efforts to stay competitive in the rapidly evolving digital landscape. Develop and implement programs to support businesses in improving production and business capacity, with particular attention to small and medium-sized enterprises because this is Vietnam's largest group of companies. Businesses can participate more effectively in global value chains and play a leading role in domestic and industrial clusters. Enhance the technological innovation ability of businesses through building development goals and long-term business strategies based on technological innovation; improve the quality of the enterprise's human resources according to international standards; Regularly grasp information about the regional and world science and technology market, focusing on using technology transfer consulting from outside; improve access to technological innovation capital sources of credit institutions.

(7) Human resources (HR) are reflected by a standardized estimate of 0.081 and a p-value of 0.005, demonstrating its significant contribution to the digital economy. Vietnam must invest in upskilling and reskilling its workforce to meet the demands of the digital era and enhance its economic potential. For human resources at the macro level: Macro management staff in ministries, branches, and localities are the people who directly manage enterprises' production and business activities and are directly involved. Next is the implementation of State policies and laws promulgated during the period. If properly fostered and trained, this team of officials will make State economic management more effective and vice versa. Therefore, training and fostering staff at the macro level must be standardized in the following directions: (i) improve political and ethical qualities to make the staff highly responsible when performing management tasks and only have good ethics to fulfill their duties. Train and foster staff in terms of capacity and expertise to ensure the effectiveness and efficiency of economic management in the new period. Have good ideology and ethics; otherwise, you cannot complete your management tasks even with good capacity and expertise. In the current process of international economic integration, improving the macro management staff's capacity is increasingly required to achieve international standards. (ii) The state needs policies to help training institutions quickly innovate university training programs and content in a streamlined, modern, practical, and appropriate direction. Reform the education and training system, prioritizing scientific and technical fields and vocational training linked to employment and according to society's needs. Training must also take a multidisciplinary approach instead of a specialized one while enhancing learners' criticism.

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(8) Lastly, Market (MA) records a standardized estimate of 0.079 with a p-value of 0.000, confirming its impact on the digital economy. Vietnam should focus on developing dynamic market mechanisms to support the growth of digital enterprises and foster a competitive and innovative digital ecosystem. In the coming time, to develop the digital economy, developing the high-tech market is an essential issue that needs to be focused on: (i) Increase investment from the budget for high-tech market development, focusing on perfecting the system of mechanisms and policies to invest in infrastructure development, develop intermediary organizations and promote demand. Technological innovation of enterprises. The State needs to allocate and allocate budget funds according to the contracting mechanism, selective bidding mechanism, and from practical needs; Carry out evaluation and management of science and technology projects invested from the budget according to output results based on assigned funds and tasks; Complete the system of management agencies and budget allocation for science and technology in a streamlined, reasonable and effective manner. (ii) Implement tax exemptions and reductions to encourage businesses to invest in technological innovation activities such as experimental production, new product production, research, implementation, and technology development. Tax exemption for intermediary and brokerage activities in the high-tech market include exhibitions, new product introductions, and technology and equipment fairs.

Limitations and future research: The study tackles eight essential factors: Information technology and digital infrastructure, digital transformation capacity in businesses, government policies and laws, human resources, digital consumer needs and behavior, E-commerce and financial technology, international economic integration, and Market. However, the digital economy still has many influencing factors that have not been included in the model, and the scope of the survey is only 5 cities in Vietnam. Therefore, future research needs to add more variables to the model, investigate and survey more subjects, and cover more provinces. Besides, it is necessary to consolidate secondary data and deeply analyze the current state of the digital economy in Vietnam over the past many years to see the overall picture of the digital economy. There is still a lot of work to be done to develop the digital economy and increase the contribution of this field to GDP. In addition to the response of the people and the positivity of businesses, the role of the Government, ministries, and branches is needed to promote digital economic development.

6. Declarations

6.1. Author Contributions

Conceptualization: L.T.H. and P.T.T.; Methodology: P.T.T.; Software: L.T.H.; Validation: L.T.H. and P.T.T.; Formal Analysis: L.T.H. and P.T.T.; Investigation: L.T.H.; Resources: P.T.T.; Data Curation: P.T.T.; Writing Original Draft Preparation: L.T.H. and P.T.T.; Writing Review and Editing: P.T.T. and L.T.H.; Visualization: L.T.H. All authors have read and agreed to the published version of the manuscript

6.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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The authors received no financial support for the research, authorship, and/or publication of this article.

6.4. Institutional Review Board Statement

Not applicable.

6.5. Informed Consent Statement

Not applicable.

6.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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