Pak. j. life soc. Sci. (2024), 22(1): 6867-6877 E-ISSN: 2221-7630;P-ISSN: 1727-4915

Pakistan Journal of Life and Social Sciences
www.pjlss.edu.pk

https://doi.org/10.57239/PJLSS-2024-22.1.00501

RESEARCH ARTICLE

The Effects of Digital Transformation on Economic Growth in the Provinces of Vietnam's Southern Key Economic Region

Thien Binh Luu*

Department of Tourism Management, FPT University, Can Tho City, Vietnam.

ARTICLE INFO

Received: May 17, 2024

Accepted: Jul 12, 2024

Keywords

Digital Transformation

Economic Growth

GDP

DGMM

***Corresponding Authors:**

Binhlt53@fe.edu.vn

ABSTRACT

This study examines the impact of digital transformation on the economic growth of the provinces in Vietnam's Southern Key Economic Region. The researchers utilize the Difference Generalized Method of Moments (DGMM) technique, created by Arellano and Bond (1991), to estimate models utilizing panel data from 8 provinces in the region between 2009 and 2017. The findings suggest that a 1% rise in the readiness index for IT application and development is associated with a 0.84% increase in the Gross Regional Domestic Product. The growth can be linked to enhancements in the IT infrastructure indices and the IT application index in the key economic zones in the southern region. The study also incorporates Karl Marx's philosophical viewpoint, which argues that economic epochs are characterized not by their output, but by their mode of production and the labor materials employed (Marx & Engels, 1993). The writers emphasize Marx's forecast that the progressive integration of science and technology into production and daily life is the primary catalyst for the swift advancement of productive forces. Nevertheless, it is important to note that the power of science and technology is not solely derived from their existence, but rather from their implementation and integration into tangible human endeavors, exemplified by the transformation of labor into mechanized systems. The authors draw policy implications for the digital transformation process in Vietnam's Southern Key Economic Region, emphasizing the importance of adopting and applying technology to drive economic growth. They also acknowledge the philosophical significance of the means of production.

1. INTRODUCTION

Over the last ten years, significant advancements have taken place in various technology fields such as Artificial Intelligence (AI), Cloud Computing, Internet of Things, Blockchain, and next-generation wireless networks (5G). The exponential growth of digital technology is revolutionizing the dynamics of interaction between governments, corporations, and citizens across nations globally. The volume of data being generated is growing, accompanied by an increased utilization of automated processes and the development of more sophisticated data processing techniques. These advancements are having a dramatic impact on society.

Digital transformation is not only a prevalent global technological trend, but it is also exerting a significant and extensive influence on economic, political, and social spheres. This highlights the

concern that nations, enterprises, and individuals will need to adjust to this emerging situation, in which digital technology will become deeply integrated into everyday routines. Hence, while lacking a widely agreed-upon definition, "Digital Transformation" can be understood as the procedure of altering production processes, lifestyles, and work practices through the use of digital technologies.

Currently, economists and policymakers are highly concerned about the effects of these substantial transformations in digital technology on the functioning of economies. Specifically, these modifications are anticipated to impact the rates of economic growth, employment, and labor productivity. Abundant data indicates that the process of digital transformation has a beneficial effect on both growth and development. Digital transformation specifically leads to a 1.4% increase in Gross Domestic Product (GDP) growth in emerging markets and a 2.5% increase in China, according to Kvochko (2013). According to Katz (2017), in OECD nations, a 1% rise in the digital ecosystem development index will lead to a 0.13% increase in GDP per capita.

This study assesses the influence of digital transformation on the economic growth of the provinces in Vietnam's Southern Key Economic Region.

2. THEORETICAL FOUNDATION

2.1 The notion of digital transformation

Recently, digital transformation (DT) has been a prominent subject of study in both theoretical and practical research. Several researchers have put forth several definitions of the idea, such as:

Digital transformation has become a prominent topic in recent research on strategic information systems (IS) (Bharadwaj et al., 2013; Piccinini et al., 2015a) and in discussions among practitioners (Fitzgerald et al., 2014; Westerman et al., 2011). DT refers to the significant transformations happening in society and industries as a result of using digital technology (Agarwal et al., 2010; Majchrzak et al., 2016). Scholars suggest that organizations must develop strategies that incorporate the consequences of digital transformation in order to improve operational performance (Hess et al., 2016).

Recent study has enhanced our comprehension of particular facets of the DT phenomenon. Previous research on IT-enabled change has consistently found that technology is just one component of the multifaceted challenge that organizations must address in order to stay competitive in the digital age (Carlo et al., 2012; Karimi & Walter, 2015). In order to develop new ways of creating value, it is necessary to engage in strategy formulation, organizational changes such as structural redesign, process transformation, and cultural evolution. These actions are essential for cultivating the ability to generate novel value creation pathways. Despite the contributions made by Gray & Rumpe (2017), Kane (2017c), and Matt et al. (2015), our understanding of this complex phenomenon is still incomplete. Furthermore, we have yet to fully grasp its ramifications across all levels of analysis.

Demirkan et al. (2016) define digital transformation as the extensive and swift transformation of corporate activities, processes, competences, and business models in order to take advantage of the changes and opportunities brought about by advancements in digital technology for society.

Hess et al. (2016) assert that digital transformation encompasses alterations in digital technologies that have the potential to introduce novel company models, generate fresh products or services, or convert organizational structures into automated procedures. The increasing demand for Internet-based media has resulted in significant transformations in whole business structures.

The purpose of this essay is to enhance the study of digital transformation by creating a comprehensive understanding that combines various viewpoints and fundamental elements of this phenomena. By synthesizing material from several fields such as strategic management, organization studies, entrepreneurship, and information systems, we analyze the fundamental components and

establish a study framework to methodically investigate digital transformation. Our comprehensive analysis demonstrates that digital transformation consists of three separate yet interconnected components - (1) the adoption of novel digital technologies, (2) the reformation of crucial operational domains, and (3) the alteration of paths for generating value. We argue that these features are evident at several levels, requiring a multi-level approach to adequately understand the complex dynamics of digital transformation.

Hence, it is evident that digital transformation is a contemporary and innovative concept in the field of study. The phrase "digital transformation" is commonly defined as the process of incorporating digital technology into business activities, resulting in improvements to corporate operations and providing value to customers (Micic, 2017). It also encompasses the changes that occur when digital technology is used to produce, process, share, and transfer information.

It is constructed based on the advancement of several technologies, including telecommunications networks, computing, software engineering, and their widespread adoption.

2.2 The notion of economic growth

Samuelson and Nordhaus (1985) define economic growth as the increase in a nation's Gross Domestic Product (GDP) or potential output. Put simply, economic growth happens when a nation's production possibility frontier (PPF) expands. Economic growth is defined as the expansion of the GDP or Gross National Product (GNP) over a specific time period.

Economic growth is a fundamental concern in the field of development economics. Economic growth and development are universally recognized as the primary objectives of all nations worldwide and serve as the fundamental indicators of progress at every stage of a country's existence. The evaluation of a country's macroeconomic successes is commonly based on major objectives such as stability, economic growth, and social equality. Of them, economic growth serves as the basis for tackling various economic, political, and social problems.

Attaining economic growth does not need every country to adhere to identical strategies. Samuelson and Nordhaus (1985) assert that England dominated the global economy during the 19th century through its groundbreaking role in the Industrial Revolution, its invention of the steam engine and railroads, and its emphasis on free trade. Conversely, Japan entered the quest for economic growth at a later stage. This nation achieved success by emulating foreign technologies and safeguarding native industries against imports, thus acquiring advanced proficiency in manufacturing and electronics.

While the individual trajectories of each country may vary, all developing nations have certain shared origins. Samuelson and Nordhaus (1985) categorized the 4 main drivers of economic growth for countries as follows: human resources (comprising labor supply, education, discipline, and incentives), natural resources (encompassing land, minerals, fuels, and environmental quality), physical capital (including machinery, factories, and roads), and technology (encompassing science, engineering, management, and business awareness).

2.3 The relationship between digital transformation and economic growth

Expanding upon the Multidimensional Digital Transformation Framework, we can envision the correlation between digital transformation and economic growth in the following manner:

Digital transformation is a complex process that encompasses various aspects like as technology, organization, and value. It has the potential to stimulate economic growth through different channels and at different levels.

At the societal level, the technological factor allows for widespread connectivity and the conversion of infrastructure into digital form, which in turn enables the smooth and effective exchange of

information, resources, and economic activity. The organizational dimension results in digitally-enabled goods and services that can improve productivity, generate new markets, and reconfigure socio-economic systems. The value dimension facilitates economic advantages by enhancing productivity, fostering innovation, and generating wealth for societies.

At the industry level, digital platforms and ecosystems have a transformative effect on industry dynamics by reducing barriers to entry and facilitating the emergence of new business models. Network-based organizational models facilitate the collaborative generation of value among participants in an industry. Platform-based ecosystems in the value dimension create opportunities for generating more money and promoting economic growth.

Implementing digital technologies at the organizational level enhances operational efficiencies. The adoption of digital business models, implementation of agile procedures, and reliance on data-driven decision-making inside a company contribute to disruptive innovation and provide a competitive edge. This results in increased production and the creation of economic value.

Individually, using digital devices and apps enhances the workforce and allows for tailored experiences, which leads to more economic engagement. An adept workforce with digital skills and appropriate cultural mindsets in the organizational dimension boosts labor productivity and pay, hence fostering economic growth.

Our approach proposes that the process of using digital technology to transform organizations and create new value routes is the key mechanism that links digital transformation to economic growth at both national and global levels. Policy measures such as constructing digital infrastructure, encouraging the digitization of organizations, cultivating digital skills, and fostering digital innovation ecosystems can enhance the beneficial economic effects.

This multi-level perspective offers a comprehensive approach to systematically examine the economic growth consequences of digital transformation in various nations, industries, and companies. The integration of technology forces, organizational dynamics, and value-based results are interrelated factors that shape economic trajectories in the digital era.

2.4 Related studies

Abundant data indicates that the process of digital transformation has a beneficial effect on both growth and development. By gaining access to additional knowledge and chances for technological cooperation, there will be a direct result of job creation, skill transfer, increased productivity, and improved accountability in both politics and business (Finger, 2007). The World Economic Forum has recognized the information and communications technology sector as a crucial factor in driving production growth. In addition, it is anticipated that digital transformation will have a 1.4% influence on GDP growth in emerging nations and a 2.5% impact in China (Kvochko, 2013). In addition, according to Katz (2017), an increase of 1% in the digital ecosystem development index has the potential to raise GDP per capita by 0.13% at the macroeconomic level. Moreover, the magnitude of this variable is greater for OECD countries compared to emerging economies.

In their study, Sabbagh et al. (2013) found that a country's GDP per capita growth rates, on average, improve by 0.75% when its digitization score increases by 10%. Nevertheless, the effects of digital revolution vary among different nations. Digitization enhances productivity and has a quantifiable effect on growth in advanced economies. Nevertheless, the result could impact the accessibility of low-skilled, low value-added positions since they are frequently relocated to developing economies where labor costs are lower. On the other hand, emerging markets have a tendency to engage in more exporting activities and are primarily influenced by sectors that involve trade. They typically benefit more from the influence of digitalization on employment than from its impact on productivity. According to Jiménez et al. (2018), it is anticipated that by 2021, around 60% of the Gross Domestic

Product (GDP) in emerging economies will be derived from digitally-enabled products or services that are developed through the process of digital transformation.

Jain (2018) demonstrated that Artificial Intelligence has the potential to contribute an additional $320 billion to the Middle East by the year 2030. In 2030, it is projected that this region would account for 2% of the worldwide advantages generated by artificial intelligence, which is equivalent to $320 billion. Furthermore, the annual growth rate of AI's contribution to the region will consistently climb by 20-34%. The benefits obtained vary among countries, with the UAE experiencing the highest growth rates, followed by Saudi Arabia. This analysis is grounded on the present circumstances of the region. The potential advantages might be significantly enhanced if governments allocate more resources towards advancing cutting-edge technical advancements and implementing artificial intelligence throughout many industries and sectors. The positive effects of AI on Middle Eastern economies can be attributed to its role as a novel productivity factor that complements existing variables such as labor, land, capital, and entrepreneurship. Considering AI as a production element relies on its capacity for self-learning and substantial self-improvement over time, rather than merely being technology-based machines with increased productivity and output.

3. RESEARCH METHODOLOGY

3.1 Research model

The authors constructed a model using the Cobb-Douglas production function to assess the influence of digital transformation on economic growth in the provinces of Vietnam's Southern Key Economic Region. The structure of this production function is as follows:

$$Y = AL^{\alpha}K^{\beta}$$

The output, denoted as Y, is determined by the output elasticities of labor (α) and capital (β), as well as the total factor productivity (A). Labor is represented by L, while capital is represented by K.

In addition, the research model was created by merging the growth theories put forward by Romer (1986) and Solow (1956):

$$GRDP_{it} = \beta_0 + \beta_1 K_{it} + \beta_2 L_{it} + \varepsilon_t \quad (1)$$

In this context, the variable "i" represents a certain province, whereas the variable "t" represents a specific year.

A recent study conducted by Aly (2020) demonstrated that digital transformation significantly contributes to fostering economic growth. Hence, it may be inferred that the variable DT_{it}, representing digital transformation, should be incorporated into the growth model, as indicated below:

$$GRDP_{it} = \beta_0 + \beta_1 K_{it} + \beta_2 L_{it} + \beta_3 DT_{it} + \varepsilon_t \quad (2)$$

Ultimately, it is necessary to incorporate the variable representing the delayed economic growth into the model. This enables the study to investigate the influence of the independent factors on the dependent variable in a dynamic state, meaning that the dependent variable is influenced by its previous values. This is a frequent phenomenon observed in macroeconomic variables of the economy.

$$GRDP_{it} = \beta_0 + \beta_1 GRDP_{(it-1)} + \beta_2 K_{it} + \beta_3 L_{it} + \beta_4 DT_{it} + \varepsilon_t \quad (3)$$

The variables within the research model are succinctly presented in Table 1.

Table 1

Indicator **Dependent Variable**	**Symbol**	**Measurement**	**Expected Outcome**	**Data Source**
Economic Growth	$GRDP_{it}$	Natural logarithm of the Gross Regional Domestic Product at region i in year t		Statistical Yearbook
Independent Variables				
Economic Growth Stagnation	$GRDP_{(it-1)}$	Lag of the dependent variable	+	Statistical Yearbook
Idle Capital	K_{it}	Natural logarithm of idle capital at region i in year t	+	Statistical Yearbook
Human Capital	L_{it}	Natural logarithm of the remaining workforce at region i in year t	+	Statistical Yearbook
Digital Transformation	ICT	Readiness index for information technology application and development	+	Vietnam Information and Communication Technology White Paper
	HTCN	Information technology infrastructure index	+	
	HTNL	Information technology human resource infrastructure index	+	
	UDCN	Information technology application index	+	

3.2 Research data

The research data consists of secondary data obtained from reputable sources. Data on gross regional domestic product (GRDP), capital stock, and labor force were collected and calculated from statistical yearbooks of the 8 provinces in Vietnam's Southern Key Economic Region (Binh Phuoc, Ba Ria - Vung Tau, Dong Nai, Ho Chi Minh City, Long An, Tien Giang, Tay Ninh, and Binh Duong provinces) between 2009 and 2017. Data on digital transformation in Vietnam was collected from the Information and Data on Information Technology Application and Development Readiness Index Reports. This data includes indicators such as the Readiness Index for IT Application and Development, IT Infrastructure Index, IT Human Resource Infrastructure Index, and IT Application Index of the 8 provinces.

3.3 Method of estimation

This study employs the Difference Generalized Method of Moments (DGMM) technique developed by Arellano and Bond (1991) to conduct regression analysis of the models. This method is frequently employed in the estimation of dynamic panel data or panel data with the existence of heteroscedasticity and autocorrelation.

The authors have confirmed the reliability of the model:

Testing for serial correlation of residuals involves examining the presence of autocorrelation in the residuals. Arellano and Bond (1991) state that GMM estimation necessitates the presence of first-order autocorrelation in the residuals, whereas second-order autocorrelation should be absent. Thus, after doing the AR(1) and AR(2) tests to assess the presence of first-order and second-order autocorrelation of residuals, respectively, we reject the null hypothesis H0 for the AR(1) test and accept H0 for the AR(2) test. Consequently, we can conclude that the model satisfies the condition.

Evaluating the adequacy and reliability of the instrumental variables: Like previous models, the accuracy of the model can be confirmed using the F-test. The F-test is used to determine the statistical significance of the estimated coefficients of the explanatory variables. The null hypothesis, denoted as H0, assumes that all estimated coefficients in the equation are equal to 0. In order for the model to be considered suitable, the null hypothesis H_0 must be rejected. Furthermore, the Sargan/Hansen test is employed to assess the validity of the null hypothesis H_0, which states that the instrument variables are valid. Accepting the null hypothesis H_0 indicates that the instrumental variables employed in the model are suitable.

4. RESEARCH RESULTS

The descriptive statistics measuring the characteristic values of the research variables are shown in Table 2.

Table 2: Descriptive statistics

Observed Variables	Average Value	Standard Error	Minimum Value	Maximum Value
Economic Growth	90,737.05	110,880.3	8,856.62	449,227
Investment	55,865.75	83,464.74	6,031.36	428,684
Labor Force	1,284.427	1,080.493	487.268	4,323.635
Digital transformation				
Readiness index	0.47141	0.12010	0.0609	0.6956
IT infrastructure index	0.44097	0.14385	0,13	0,79
IT human resource infrastructure index	0,61110	0,61110	0,61110	0,61110
IT application index	0,47344	0,47344	0,47344	0,47344

The descriptive statistics indicate that the mean gross domestic product (GDP) in the major economic regions of Southern Vietnam from 2009 to 2017 was 90,737 trillion VND. During the same time frame, the mean aggregate investment and workforce of these areas amounted to 55,865 trillion VND and 1,284 thousand individuals, respectively. Conversely, the mean index of preparedness for the implementation and advancement of information and communication technology (ICT) was 47.14%. The models provided in Section 3 were evaluated using STATA software with balanced panel data from 8 main economic zones of Southern Vietnam from 2009 to 2017. The table below displays the estimation results of the models.

Table 3 presents the estimation results of models that analyze the impact of digital transformation on economic growth in the key economic regions of Southern Vietnam.

Table 3: Regression results

Observed variables	Model 1	Model 2	Model 3	Model 4
Economic growth (lag 1)	0,43452	0,50098*	0.85208	0,98064**
Investment	-0,48244	-0,48760	-0,55425	-10,12537**
Human capital	3,63227***	3,20914***	1,72403	5,01980***
Digital transformation				
Readiness index	0,84103*			
IT infrastructure index		0,70979**		
IT human resource infrastructure index			-0,73504	
IT application index				0,92918**
AR (1) p-value	0,021	0,031	0,090	0,000
AR (2) p-value	0,207	0,458	0,185	0,975
Hansen p-value	0,518	0,449	0,423	0,897
Number of groups	8	8	8	8
Number of instruments	7	6	6	6
Second stage F-test p-value	0,000	0,000	0,000	0,000

Note: The DGMM approach is used to estimate the impact model of digital transformation on the economic growth of important economic regions in the Southern Region. The p-values for AR(1) and AR(2) represent the statistical significance of the first-order and second-order residual correlation tests, respectively. The Hansen p-value refers to the p-value obtained by the Hansen test, which assesses the appropriateness of instrumental variables in the model. The p-value of the F-test for the model's appropriateness is referred to as the Second stage F-test p-value. The standard errors are contained inside parenthesis.

Symbols: ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

The results in Table 3 show that the models have p-values of the AR(1) test below the 10% significance level and p-values of the AR(2) test above the 10% significance level. Thus, the model displays first-order autocorrelation in the residuals, but not second-order autocorrelation. Furthermore, the Hansen test of the model yields a p-value that exceeds the 10% significance level, suggesting that the instrumental variables employed in the model are suitable. Furthermore, the p-value of the F-test is below the 10% significance level, suggesting that the model is adequate. Table 3 also illustrates an additional condition that is met when employing the DGMM method: the number of instrumental variables does not surpass the number of observation groups. Therefore, the models provide dependability for analysis.

The estimation findings indicate that the coefficient of the ICT variable, which represents digital transformation, is 0,841. This coefficient is positive and highly statistically significant at the 10% level. Hence, the process of digitization has a beneficial effect on the Gross Regional Domestic Product (GRDP) of provinces located in Vietnam's Southern Key Economic Region. This finding aligns with the research conducted by Finger (2007), Kvochko (2013), and Katz (2017). More precisely, a 1%

improvement in the readiness index for IT application and development is expected to result in a 0.84% growth in the Gross Regional Domestic Product in Vietnam's Southern Key Economic Region.

The increase in question can be attributed to the growth of the IT infrastructure indexes and the IT application index in the economically significant southern regions.

Table 3 indicates that the HTCN and UDCN variables have coefficients of 0.7098 and 0.9292 respectively. These coefficients are positive and highly statistically significant at the 5% level. Therefore, an increase in both the IT infrastructure index and the IT application index will result in a corresponding increase in the Gross Regional Domestic Product of provinces in Vietnam's Southern Key Economic Region. Nevertheless, the HTNL variable's coefficient lacks statistical significance, suggesting that the IT human infrastructure index does not affect the Gross Regional Domestic Product of provinces in the Southern Key Economic Region. This outcome implies that the existing IT personnel are inadequate for the demands of digital transformation progress and have not played a role in fostering economic expansion.

In addition to the variables that indicate digital transformation, Table 3 reveals that the coefficient of the K variable is positive and exhibits a high level of statistical significance across all models. This finding suggests that the Gross Regional Domestic Product of provinces in the Southern Key Economic Region is positively influenced by capital investment. This discovery is consistent with the growth theories put forward by Romer (1986) and Solow (1956), as well as the research conducted by Nguyen Thi Canh (2021).

The study did not see a discernible effect of human capital on the Gross Regional Domestic Product of provinces in the Southern Key Economic Region. Furthermore, it is worth noting that the Gross Regional Domestic Product of provinces in the Southern Key Economic Region is not affected by the IT human infrastructure index.

5. IMPLICATIONS FOR POLICY AND RECOMMENDATIONS

5.1 Implications for policy

The authors suggest the following policy recommendations, based on the research findings, to enhance the Gross Regional Domestic Product of provinces in Vietnam's Southern Key Economic Region during the digital transformation process:

The findings indicate that the IT infrastructure has a favorable influence on the Gross Regional Domestic Product (GRDP) of provinces in the Southern Key Economic Region. Hence, it is imperative for the provinces in this region to implement policies that promote and incentivize firms to invest, foster growth, and engage in economic activities related to emerging technology. Promote the prioritization of the construction of 4G mobile networks by telecommunications businesses in the region, with an emphasis on maintaining reliable service provision. Additionally, encourage these companies to strategize and prepare for the implementation and expansion of 5G mobile networks in order to satisfy the connectivity requirements of the Internet of Things at the earliest opportunity.

The findings also demonstrate that the implementation of IT applications has a favorable influence on the Gross Regional Domestic Product of provinces in the Southern Key Economic Region. Therefore, it is necessary for provinces in this region to enhance the implementation of IT in government agencies and organizations. Further expedite the process of transforming telecommunications corporations into entities with equal ownership to stimulate competition and lower telecom service fees, thus enhancing people's accessibility.

While the research did not discover any statistically significant effect of the labor force on the Gross Regional Domestic Product of provinces in the Southern Key Economic Region, it is nevertheless essential to cultivate a workforce that is well-suited for the region's digital transformation goals. In

order to accomplish this, it is necessary for provinces to enhance knowledge and proficiency in the utilization of information technology in the daily lives of individuals, particularly among authorities and public employees within the local political framework. Furthermore, it is imperative to establish strategies for the education and cultivation of top-tier personnel who can effectively fulfill the demands of the extensive digital transformation process in the coming years.

Additionally, Table 3 demonstrates that the regression coefficient of the lagged dependent variable (economic growth) is both positive and statistically significant in models 2 and 4. This indicates that present economic growth is positively influenced by previous economic growth rates. Hence, it is imperative to provide consistent economic expansion in order to achieve sustainable development in the provinces of the Southern Key Economic Region.

To summarize, the empirical data from this study validates the favorable influence of digital transformation, particularly the advancement and utilization of IT infrastructure, on the economic expansion in Vietnam's Southern Key Economic Region. Given this discovery, it is advisable for provincial governments to implement suitable policies and processes to encourage digital transformation, thereby enhancing economic growth and cultivating a skilled workforce capable of meeting future labor requirements in the digital age.

5.2 Recommendations

Based on research findings, I propose the following proposals to further stimulate the southern economy in the near future:

- Give priority to investing in the development of digital infrastructure, specifically by expanding 4G mobile networks, maintaining reliable service provision, and aggressively preparing for the implementation of 5G networks to meet the increasing need for Internet of Things connectivity. A strong and resilient digital infrastructure is essential for a smooth digital transformation and enables the creation of economic prospects.
- Promote and incentivize businesses, particularly those operating in the telecommunications industry, to allocate resources towards the development and monetization of innovative technology. Measures like tax incentives, collaborations between the public and private sectors, and centers for innovation can encourage private companies to invest in advanced digital solutions that enhance productivity and promote economic expansion.
- Improve the proficiency and knowledge of the workforce in digital skills and literacy by implementing customized training programs and educational reforms. Partnerships among academic institutions, industry leaders, and government agencies can facilitate the cultivation of a skilled workforce in cutting-edge technology, allowing firms to effectively seize digital opportunities.
- Encourage the implementation of digital technology in government services and operations, promoting openness, effectiveness, and citizen participation. E-governance projects not only enhance the delivery of public services but also act as catalysts for wider digital adoption in various industries, hence generating economic advantages.
- Create a favorable regulatory and policy framework that promotes digital innovation and entrepreneurship. Efficient rules, robust data protection frameworks, and strong cybersecurity measures may enhance customer confidence and establish a safe digital environment for businesses to flourish.
- Facilitate partnerships and platforms for exchanging expertise across different sectors in order to spread the most effective methods and speed up the use of digital technology in various industries. These efforts can promote the exchange of ideas, foster peer learning, and accelerate digital transformation on a larger level.

- Regularly evaluate and monitor the progress of digital transformation, utilizing appropriate indicators and benchmarks. This data-centric strategy can provide insights for policies based on facts, pinpoint areas that need enhancement, and guarantee that digital activities are in line with wider economic development objectives.

By adopting these suggestions, the Southern area of Vietnam can utilize digital transformation as a driving force for long-lasting economic expansion, creativity, and international competitiveness in the future.

REFERENCES

Aly, H. (2020). Digital transformation, development and productivity in developing countries: is artificial intelligence a curse or a blessing? *Review of Economics and Political Science.*

Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, 58(2), 277-297. https://doi.org/10.2307/2297968

Demirkan, H., Spohrer, J.C., & Welser, J.J. (2016). Digital innovation and strategic transformation. *IT Profesional*, 18(6), 14-18.

Finger, G. (2007). Digital Convergence and Its Economic Implications. *Development Bank of Southern Africa*.

Hess, T., Matt, C., Benlian, A., Wiesboeck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*, 15(2), 123-139.

Nguyen Thi Canh (2021). Measuring the quality of Vietnam's economic growth. *Journal of Finance and Marketing Research*, 1(61). https://doi.org/10.52932/jfm.v1i61.62

Jain, S. (2018). US $320 billion by 2030?: The potential impact of AI in the Middle East, PwC. https://www.pwc.com/m1/en/publications/documents/economic-potential-ai-middle-east.pdf

Jiménez, A., & Zheng, Y. (2018). Tech hubs, innovation and development. *Information Technology for Development*, 24(1), 95-118. DOI: 10.1080/02681102.2017.1335282.

Katz, R. (2017). Social and Economic Impact of Digital Transformation on the Economy. *International Telecommunication Union*.

Kvochko, E. (2013). Five ways technology can help the economy. Retrieved July 12, 2018, from World Economic Forum: https://www.weforum.org/agenda/2013/04/five-ways-technology-canhelp-the-economy/

Micic, L. (2017). Digital transformation and its influence on GDP. *Economics*, 5(2), 135-147.

Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy*, 94(5), 1002-1037. https://doi.org/10.1086/261420.

Sabbagh, K., Friedrich, R.O.M.A.N., El-Darwiche, B.A.H.J.A.T., Singh, M.I.L.I.N.D., & Koster, A.L.E.X. (2013). Digitization for economic growth and job creation: regional and industry perspective. *The global information technology report*, 2013, 35-42.

Samuelson, P. A., & Nordhaus, W. D. (1985). Economics (12th ed.). New York: McGraw-Hill.

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics*, 70(1), 65-94. https://doi.org/10.2307/1884513.