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Digital Transformation in Vietnam - Trends and Solutions in the Coming Time

Tran Hung Nguyen
Thuongmai University, Vietnam

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Corresponding Author: **Tran Hung Nguyen**

Abstract

Vietnam is a developing country but has a relatively high growth rate of the Digital Economy and digital transformation. Digital transformation helps businesses cut costs, optimize performance and labor productivity, in addition, this activity also promotes innovation, thinking, and creating new values. For that reason, digital transformation is the key for Vietnam to make changes and develop rapidly economically, realizing its strong

aspirations. Therefore, identifying digital transformation trends is always an important in Vietnam and urgent issues for both the Government and businesses in Vietnam. The article has identified the main trends of digital transformation and recommended some solution implications for the Government and businesses to make the best use of these trends to achieve economic development goals and the society of the nation.

Keywords: Digital Transformation, Trends of Digital Transformation, Vietnam, Solutions

1. Introduction

According to estimates by Markets and Markets (2023)^[10], the global Digital Transformation market size accounts for 695.5 billion USD in 2023 and is expected to reach 3,144.9 billion USD in 2030, at a rate CAGR growth is 24.1% from 2024 to 2030. The increasing trend of digitalization and the need for optimal resource use are also expected to be the driving force behind the growth of digital transformation in the world.

Fortune Business Insights (2023)^[7] estimates that the digital transformation market size is valued at 1.91 trillion USD in 2022, and is expected to increase from 2.27 trillion USD in 2023 to 8.92 trillion USD. by 2030, achieving a CAGR of 21.6% during the forecast period. North America dominates the global market with a market share of 44.5% in 2022. During this period, companies like Alphabet LLC, Oracle Corporation, SAP SE, Salesforce, Inc, provide several solutions and services. Digital transformation services in the market include AI technologies and software, cloud computing, machine learning, Internet of Things and other solutions into the business processes of customer enterprises. Around the world, the rapid adoption of advanced technologies such as AI, IoT, is driving the growth of the global digital transformation market.

Compared to the current situation in the world, Vietnam has a fairly strong level of digital transformation and digital economic growth. Vietnam's digital economy is predicted by experts to grow strongly, driven by the development of e-commerce and will create momentum for the overall economy.

Comments from Google, Temasek, Bain & Company (2023) show that Vietnam's digital economy in 2023 will have the fastest growth rate in Southeast Asia with a value of 30 billion USD, and by 2025 it may reach the value 45 billion USD. It is forecast that by 2030, Vietnam's Digital Economy can reach a maximum value of 200 billion USD with the second highest growth rate in Southeast Asia. Therefore, the coming time is the best time for Vietnam to identify trends, build new business models and strategies in implementing digital transformation and developing the digital economy. From there, creating momentum helps restore and expand business activities of businesses and expand markets after the Covid-19 pandemic.

2. Overview of the current situation of digital transformation in Vietnam

In recent years, Vietnam has been assessed by international organizations and friends as one of the countries with the highest growth rate in Asia and the world. According to the World Bank's assessment, the innovation process has helped transform Vietnam from one of the poorest countries in the world to a middle-income country with an increasingly high position in the international arena. However, compared to developed countries, Vietnam is still a middle-income country and the competitiveness of the economy is not high. One of the main factors affecting people's income level is low labor productivity and limited application of science and technology in production and business. Therefore, to continue to have breakthrough

developments in the new period, narrow the gap with developed countries, move beyond the middle-income trap, towards a sustainably developed economy, one of the most basic and fundamental solutions are strong digital transformation, leading the region in the fourth industrial revolution.

On that basis, the Prime Minister signed Decision No. 749/QĐ-TTg, dated June 3, 2020 approving the "National Digital Transformation Program to 2025, orientation to 2030" with the goal of bringing Vietnam is in the group of 50 leading countries in e-Government (EGDI). Accordingly, digital transformation in Vietnam targets three pillars: Digital infrastructure; Digital Government; Digital economy and digital society. The specific results achieved by Vietnam are as follows:

* For digital infrastructure: Orientation for rapid development, creating a foundation for socio-economic development, especially in the digital age. Accordingly, telecommunications infrastructure has spread nationwide with more than 600,000 km of fiber optic cables, with high access speed (> 27 MBps). The number of fixed broadband subscribers is more than 13 million (of which more than 12 million subscribers use FTTx fiber optic cable, access speed is more than 10 MBps). Total international bandwidth reached more than 8.1 TBps. The mobile network is developed, coverage rate reaches 99.7%. The 5G mobile network has been licensed for testing. When deployed, it will be a breakthrough in connection speed and an important foundation connecting IoT infrastructure in digital transformation. The proportion of people with smartphones and broadband fiber optic internet accounts for a large proportion and will increase in the future. Thus, it can be said that the telecommunications network is one step ahead in preparing infrastructure for digital transformation (Ministry of Information and Communications, 2023) [1].

* For Digital Government: In recent times, information technology has been applied in state management agencies to develop e-Government, contributing to administrative reform. The national public service portal has provided 3,699 online public services at levels 3 and 4 (submit online applications and receive results at home); more than 2.1

million registered accounts (an increase of more than 2.8 times over the same period); more than 122.7 million status sync records (an increase of more than 2 times). 41/63 provinces and cities deployed 36,300 community digital technology groups to villages and hamlets with nearly 200,000 participating members (Ministry of Information and Communications, 2023) [1].

* For digital economy and digital society: According to data from the Ministry of Industry and Trade, the scale of Vietnam's retail e-commerce (B2C) market has grown significantly, in 2015, B2C revenue reaching 5 billion USD, by 2022, revenue has grown to 16.4 billion USD, an increase of 20% compared to 2021 and accounting for 7.5% of the country's revenue of consumer goods and services. The number of online shoppers in Vietnam will reach 60 million people in 2022, with the online shopping value of one user reaching 260-285 USD/person. The contribution of the digital economy to GDP continues to increase. The proportion of added value of the digital economy in GDP, according to the Ministry of Information and Communications - the standing agency of the National Committee on Digital Transformation, in 2022, the proportion of Vietnam's digital economy will reach 14.26 % of GDP is higher than in 2021 (11.91%) and the target set for 2025 is 20%. The number of digital technology enterprises reached 67,300 enterprises, an increase of nearly 3,500 enterprises compared to 2021, reaching a rate of 0.69 enterprises per 1,000 people. The percentage of businesses using electronic invoices is 100% (Table). In addition, information technology has been widely applied in society, contributing to improving people's quality of life and reducing social gaps, especially in the fields of education and health. Many technology applications are deployed in training (electronic lectures; online learning...), in educational management (enrollment management information system, student learning results management). In the medical field, too, nearly 100% of hospitals across the country deploy hospital management software applications in their operations (Ministry of Information and Communications, 2023) [1].

Table 1: Comprehensive digital transformation across pillars in Vietnam

(Unit: %)

Criteria	2020	2021	2022	2025
Digital infrastructure				
Percentage of people with smartphones	72	75	85	100
Percentage of households with broadband fiber optic internet	58	65	70	100
Digital Government				
Proportion of online public services level 4	30	100	100	100
Rate of online public services generating records	38	40	80	100
Percentage of administrative procedure documents processed online	24	30	50	80
Percentage of online public services that meet quality standards	-	-	10	100
Percentage of statistics and reports performed online (estimated)	-	10	50	100
Percentage of state administration providing fully open data by category	-	5	50	100
Digital economy and digital society				
Proportion of digital economy in GDP (estimated)	8,2	9,6	11,5	20
Percentage of SMEs using digital platforms (estimated)	3	10	30	50
Electronic invoice rate	-	24	100	100
Percentage of businesses using electronic contracts (estimated)	30	40	50	80
Proportion of e-commerce revenue	5,5	6-8	10	20
Percentage of people with basic digital skills	-	-	10	70
Percentage of the adult population with an electronic payment account	60	70	90	100
Percentage of the adult population with a personal digital signature	0,4	0,4	10	50
Percentage of people connected to the network with basic protection	2	3	10	70
Proportion of digital technology human resources in the workforce	1	-	-	2

Source: Ministry of Information and Communications, 2023)

In 2023, according to a report from the Ministry of Information and Communications, Vietnam has many outstanding results in digital transformation. Vietnam's national digital transformation index from 2020 to 2022 increased by 48%, from 0.48 to 0.71. In 2023, this index is forecast to reach 0.75. The proportion of digital economy in Vietnam's GDP in 2023 will reach 16.5%. Vietnam's digital economic growth rate is about 20%/year, 3 times faster than GDP growth rate. There are more than 1,500 Vietnamese digital technology enterprises with revenue from foreign markets, an increase of more than 7% compared to 2022. Total revenue from foreign markets is estimated at 7.5 billion USD, an increase of 4% compared to 2022. Revenue of information technology parks is concentrated at about 15 million USD/1 hectare/1 year (Ministry of Information and Communications, 2024)^[2].

Vietnam is in the group of 10 leading countries in the number of new downloads of mobile applications for 2 consecutive years (2022, 2023). The number of users on Vietnamese digital platforms grows by 46% compared to 2022. 03 state agency applications with a large number of users are VneID of the Ministry of Public Security, VssID of Vietnam Social and Youth Insurance South of the Central Youth Union. Vietnam has achieved impressive achievements at international competitions on information security (Ministry of Information and Communications, 2024)^[2].

By the end of 2023, ministries and branches have reduced and simplified nearly 2,500 business regulations and 528 administrative procedures related to citizens. Connecting and sharing data brings specific results, solving interdisciplinary problems that were previously difficult to completely solve.

According to the Ministry of Information and Communications (2024)^[2], some typical indicators marking Vietnam's digital transformation achievements in 2023 include:

- Vietnam's Innovation Index ranks 46th, up 2 places compared to 2022 according to the ranking of the World Intellectual Property Organization. From 2018 until now, Vietnam has continuously maintained in the group of 50 leading countries.
- Vietnam's Postal Index in 2023 will reach level 6/10 according to the assessment and ranking of the Universal Postal Union and continuously maintain in the group of 50 leading countries from 2018 to present.
- Vietnam is in the group of 10 leading countries in the number of new downloads of mobile applications in 2 years: 2022, and 2023).
- The number of users on Vietnamese digital platforms grows by 46% compared to 2022. 03 applications of state agencies with a large number of users are VNeID (Ministry of Public Security), VssID (Social Insurance) and Vietnamese Youth (Central Youth Union).
- By the end of 2023, ministries and branches have reduced and simplified nearly 2,500 business regulations, simplifying 528/1,086 administrative procedures related to citizens.
- Regarding information security, Vietnam has achieved impressive achievements at international information security competitions at both the expert and youth levels. Viettel's team of experts won the world's most prestigious competition among experts Pwn2Own; The

student team of Ho Chi Minh City National University surpassed 37 teams from 10 ASEAN countries to win the ASEAN Cyber Shield competition; The student team of Hanoi University of Science and Technology surpassed 233 teams from 10 ASEAN countries to win the Students with Information Security contest.

- Regarding implementing the goals set by the National Digital Transformation Program, National Strategy for Developing Digital Government, Digital Economy and Digital Society in 2023, there are 62 goals, including: 62 goals, of which: 18 goals have been completed (reaching 29%), 27 goals have been achieved. The ability to complete is high (accounting for 43.5%) and 17 goals require concentrated effort to be completed on time (accounting for 27.5%). The 2023 plan sets out 126 tasks, 102 tasks have been completed, reaching a rate of 81%.

3. Digital transformation trends in Vietnam

Facebook, Bain & Company's report (2021)^[6] shows that Southeast Asia is the leading region in digital transformation in Asia - Pacific, in which Vietnam is one of the countries with good performance. best. By 2026, Vietnam will be the fastest growing e-commerce market in Southeast Asia, with the total value of e-commerce goods reaching 56 billion USD, 4.5 times the predicted value in 2021.

With practical issues in the context of digital transformation activities, along with growth potential in Vietnam in the coming time, the main trends of digital transformation in Vietnam will include:

Firstly, using industrial robots to promote growth.

Industrial robots are expected to play an essential role in manufacturing systems as robots operate several important functions in industries. Manufacturers are deploying various types of robots to perform repetitive actions, thereby expanding the market size. For example: According to the International Federation of Robotics recorded 553,052 industrial robot installations in factories around the world – a growth rate of 5% in 2022, year-on-year. By region, 73% of all newly deployed robots were installed in Asia, 15% in Europe and 10% in the Americas. There is no indication that the overall long-term growth trend will come to an end soon: Rather the contrary will be the case. The mark of 600,000 units installed per year worldwide is expected to be reached in 2024. Currently, there are about over 4 million robots operating worldwide (IFR, 2023)^[9].

In Vietnam, industrial robots are one of the digital transformation trends that started in 2019. According to estimates by HBS (Harvard Research Organization), the number of robots in Vietnam increased to 411,000 and the demand for their use increased. Robot usage is still growing strongly. Vietnamese businesses have applied robotics in many different fields such as logistics, engineering, medicine, etc.

The appearance of Robots greatly supports businesses in production, especially harsh and dangerous activities. Implementing digital transformation using robots will help businesses reduce costs, increase labor productivity and improve the quality of the working environment. At the same time, Robots also ensure uniformity in product quality, minimizing errors during the production process. Thanks to this, businesses increase flexibility in production, enhance brand reputation and competitive advantage in the market.

Secondly, use cloud, IoT and 5G infrastructure to drive growth

The combination of 5G, cloud technology and IoT will improve the functionality, capacity and agility of many industries, especially for cloud-based enterprises. Some companies are envisioning 5G with cloud services to deliver low latency, faster speeds, and more capacity. For example, Ericsson has more than 230 cloud infrastructure customers worldwide. Some of the company's leading service providers include Telefonica, Swisscom, XL Axiata, Telkomse, Far EasTone and others.

The company has a telecom-grade cloud platform, Ericsson NFVI, with 5G and cloud functionality. It runs telecommunications systems, operational support, and many IT and IoT applications on cloud computing platforms such as PaaS, SaaS, and IaaS with rapid 5G core deployment. As a result, companies are investing in 5G adoption and cloud infrastructure development by acquisitions, partnerships, and collaborations.

For Vietnamese businesses, thanks to the above features, businesses will create an effective operating model, improve the ability to flexibly adapt to the market and serve customers better. At the same time, business activities will be managed more strictly and transparently. Currently, with an estimated 700 million devices connected, IoT is a strongly growing digital transformation trend in the world and digital transformation in Vietnam is no exception to this trend. This trend will explode in Vietnam in the near future when the 5G network becomes popular with all people. Broadband IoT (4G/5G) will eliminate 2G and 3G to become the technology with the largest usage rate in Vietnam.

In production and business activities in Vietnam, the application of a combination of cloud infrastructure, 5G and IoT will continue to be a new digital transformation trend, although in the world there are already corporations and large businesses apply a combination of 5G and IoT technology and achieve positive results. Yen Phong Industrial Park, Bac Ninh province, is the first industrial park in Vietnam to apply 5G and new technological achievements to production. The project signed on November 14, 2021, between the People's Committee of Bac Ninh province and Viettel Military Telecommunications Group, promises to open a smart production model for the Vietnam's economy in the near future.

Thirdly, the trend of using virtual reality technology to enhance customer experience

Virtual reality is said to be a prominent trend in the digital transformation era in Vietnam in the coming time. Virtual reality can simulate a real space or a simulated environment. Depending on the purpose, different utilities are integrated, but 3D technology and 360-degree rotation are required in the designs. VR has been used in all industries, in many aspects, and brings many benefits and positive experiences to customers. Virtual reality technology - VR is created based on specialized software and controlled by a smart device. This technology not only creates a virtual environment but also makes people a part of it. From there, users will be able to interact in this virtual environment,

with many gestures and senses such as hearing, smell, and touch. Currently, VR technology has been applied in a number of fields in Vietnam such as medicine, real estate, tourism, etc. For example in the field of education: VR technology has the ability to create virtual spaces for classrooms. School, school campus. Users can visit and explore the entire school's landscape without having to go there. Virtual reality schools can present and introduce school facilities and information in the most creative and intuitive way.

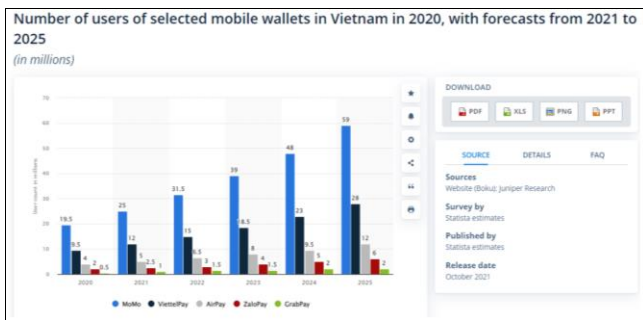
For the architecture and interior design industries, VR allows designers to see more intuitive images to easily complete products and limit errors. With tourism, VR will help businesses reduce the pressure on arranging time, luggage transportation and food services at tourist destinations. With just a few devices, businesses can quickly take customers to tourist destinations. This will be a new development path for Vietnam's tourism industry. For example: Virtual reality accurately simulates a location, including external structures and internal details. Visitors will have a tour to tourist destinations and learn more information about the destinations. Virtual reality travel helps save costs, travel time, as well as risks during the trip.

Fourthly, digital payment and contactless solutions will be the digital transformation trend in the near future

According to market research company Statista, transaction values for digital commerce and mobile POS payments in Vietnam are both at a high level. The growth numbers are expected to reach 19.5 billion USD and 4 billion USD by 2025, respectively. In particular, digital commerce has better growth and forecasts than mobile POS payments.

Statistics from Statista (2021)^[15], updated in October 2021, show that in the period 2020 - 2025, there are 5 types of mobile payments that are notable and have the strongest development compared to electronic payment methods. Other names are: MoMo, Viettelpay, Airpay, Zalopay and Grappay. Accordingly, by 2025, the number of Vietnamese people using MoMo will reach about 59 million; Viettelpay has about 28 million users; Shopee's Airpay has about 12 million users; Zalopay has about 6 million users and Grappay has about 2 million users.

In fact, Statista estimates that Vietnam in 2021 is already one of the major countries in the world for mobile POS payments. Ho Chi Minh City-based fintech app MoMo and ViettelPay, launched by major Vietnamese telecommunications provider Viettel, are considered two major domestic initiatives in mobile payments. For example, in the past, the focus was mainly on small B2C payments. Doing this so successfully that Vietnam has attracted the attention of foreign giants, such as super app Grab or gaming and e-commerce company SEA, turning Vietnam into an exciting market. Location for digital payments companies. Before the appearance of two giants from Singapore, MoMo began to expand its service network, branching out into consumer lending or insurance. Statista's statistical forecast also shows that, in the period from 2020 - 2025, the number of MoMo mobile wallet users will increase by more than 200%, marking the rapid digitization of payments in Vietnam (Statista, 2021)^[15].



Source: Statista, 2021

Fig 1: Number of users by each type of mobile wallet in Vietnam period 2020 - 2025

Fifthly, the explosion of customer data platforms (CDP) in the digital transformation process.

The digital transformation trend in 2023 and the following years in Vietnam is the explosion of the customer data platform (Customer Data Platform - CDP) to convey messages. CDP is an important source of customer data in implementing advertising and marketing activities. Through this, businesses will be able to convey messages in a personalized and attractive way to customers. In recent years, CDP is being strongly applied in business and has become an important part of the digital transformation process. Many businesses in Southeast Asia have successfully applied customer data platforms to implement marketing and sales personalization strategies. In addition, the move towards multi-channel customer experience also forces retailers to take new directions in how to contact customers. At the same time, optimize and make the customer journey more interesting across channels and touchpoints.

In the Vietnamese market, POS and ERP systems appear in more than 90% of retail store chains. Businesses can integrate CDP with these two systems to market to each customer via text message, Zalo, Tiki,... or the business's customer care system and process. Besides, CDP can also be used in finance and information technology departments to make quick decisions about products, services or other business activities.

Sixthly, banking will be the field that implements digital transformation most strongly in Vietnam.

Digital transformation brings great benefits to the banking industry, including increased efficiency, transparency and safety in transactions. Furthermore, digital transformation also opens up new competitive opportunities, helping banks grow their business more sustainably and enhance their position in a challenging economic context. 2023 continues to be considered a successful year in digital transformation for banks with many modern technology applications being launched. Digital transformation activities not only help increase convenience and ensure safe transactions for customers, but also help banks achieve stable growth plans. Fortune Business Insights (2023) [7] report also shows that the strong application of digital technology in business activities is taking place in the fields of: Banking, Finance, Insurance Services (BFSI), In which Banking is the field where digital transformation is taking place most strongly. Based on industry, the market is classified into IT and telecom, BFSI, retail and consumer goods, transportation and logistics, government, healthcare, and others (oil and gas, media and entertainment). The BFSI segment holds the

largest market share due to the increasing adoption of smart devices by BFSI. For example, in January 2022, Bank of America launched CashPro forecasting software based on AI and Machine Learning (ML) technology to accurately predict customers' future cash positions. The AI-based solution was developed in partnership with Fintech Company Cashpro Online specializing in AI and ML technology. The healthcare segment is projected to grow at the highest CAGR during the forecast period.

According to technology experts, with the growing trend of digitalization, digital transformation activities in the banking sector will continue to be enhanced in the next 5 years. In particular, banks will race to apply new technologies such as AI, information security (Cyber Security), cloud computing... Digital transformation brings great benefits to the banking industry, including Enhance efficiency, transparency and ensure safety in transactions. Furthermore, digital transformation also opens up new competitive opportunities, helping banks grow their business more sustainably and enhance their position in a challenging economic context. The digitalization process is leading to the decoupling of banking businesses and transformation across the entire Vietnamese banking system. At the same time, it also allows banks to leverage the power of data analysis and artificial intelligence to make better business decisions and provide personalized services to customers. New technologies continue to transform the banking industry and increase competition. This trend is also a major trend in the world and Vietnam in the near future.

Seventhly, data security and network security will receive more attention in the near future.

Security concerns for business data are a major concern in the adoption of digital technology. IoT, cloud, AI and blockchain technologies are spreading at a rapid pace, requiring better protection and privacy to mitigate cyber-attacks and data breaches. According to Trustwave Spider Lab (2022) [18], common vulnerabilities and exposures (CVEs) in 2022 only account for 36% of the CVEs in 2021, but the number of critical vulnerabilities is 18%, an increase of 5% compared to 13% of 2021. According to Gartner, organizations will spend \$188.3 billion on information security and risk management products and services by 2023, rising to \$262 billion in global spending by 2026. Growing Concerns increase in data security, data breaches and cyber attacks using advanced technologies hindering the growth of the global market (Cybersecurity Drive, 2022) [5]. Since and after the COVID-19 pandemic, Vietnamese people have gradually become familiar with and caught up with the trend of working remotely (Work from home) or working in combination (Hybrid working). This brings certain advantages to organizations in operations, but also causes businesses to face the risk of information leaks on the Internet. In Vietnam, organizations and businesses are gradually interested in technology solutions to ensure information security. Currently, when implementing digital transformation, businesses will use big data (Big Data) and artificial intelligence (AI) to avoid information disclosure and prevent cyber security risks from occurring. In the work of preventing and preventing cyber security risks, the above two technologies are used the most because of their high capacity, fast processing speed, low errors, ensuring support for businesses with large amounts of data. Large and small and medium-sized enterprises lack human resources in digital transformation. Therefore, in the coming time this

trend will also promote the use and development of big data and artificial intelligence in business activities, especially data security and network security.

Eighthly, attacks on 5G network infrastructure are possible.

5G is the latest mobile generation that is being developed and exploited commercially by many countries around the world, including Vietnam. According to data published in October 2023 by the Global Mobile Suppliers Association (GSA), more than 4 years after Korea deployed the world's first commercial 5G network in April. / In 2019, there have been 292 5G commercial networks globally and 578 mobile operators are starting to invest in 5G networks. Therefore, with the 2G, 3G and 4G network generations, 5G will provide users with completely new experiences such as experiencing virtual reality games, exercising with virtual coaches, and visiting art museums. Virtual magic... With an ideal maximum speed 100 times faster than the 4G network, the 5G network is expected to give users the fastest online learning, shopping and working experience.

In 2024, 5G networks are forecast to become popular in many countries around the world, becoming a new mobile information standard, providing users with extremely fast data speeds and extremely low latency. But this trend does not stop there, research on next generation mobile technology (6G) will be strongly promoted by leading technology companies in the world, creating a premise for develop and commercialize the advanced mobile generation after 5G. On May 10, 2019, the Military Industry and Telecommunications Group (Viettel) together with Ericsson Group (Sweden) made the first call on the 5G mobile network in Vietnam. The activity is part of the technical testing program implemented by Viettel, to evaluate all aspects of the ability to apply technology in practice in Vietnam. The event marks Vietnam as one of the earliest countries to successfully test 5G networks in the world.

However, with increasing access to connection technologies, and also just in the initial steps of commercial deployment of 5G networks in Vietnam, Vietnam's 5G network technology will certainly have many vulnerabilities that criminals can use. Cybercriminals may find new opportunities to attack. With more devices coming online every day, it is not difficult to predict that cyber criminals will take advantage of this to conduct cyber attacks in the future. A successful attack on 5G infrastructure could easily disrupt important industries such as oil and gas, transportation, public security, finance and healthcare, so Vietnam needs solutions. Preventive measures to avoid harm from attacks. This will also be a trend in the process of implementing digital transformation in Vietnam in the coming time.

4. Policy implications on promoting digital transformation with sustainable development in Vietnam

4.1 For the Government

The achievements in economic and social development over nearly 40 years in Vietnam are impressive. The challenges of reform and development are also huge. Vietnam's desire to "catch up" and "advance with" the times is increasingly burning. With the same aspirations, initial steps have been taken. Yesterday's success does not guarantee success today or tomorrow. Vietnam is still a transitional economy, the institutional foundations of the market economy still need to continue to be improved, meeting the new requirements of

the deep integration process of the 4th industrial revolution era. Digital transformation and sustainable development.

To be able to grasp the opportunities and make good use of the above trends, the Vietnamese Government needs to synchronously implement a number of policies to promote digital transformation in the coming time as follows:

The first, create modern institutions and an effective state.

At the national level, a smart nation includes three components: Digital government, digital economy and digital society. At the local level, smart cities also include three corresponding components: Digital government, digital economy and digital society within the geographical scope of that city. In addition, Vietnam needs to promote the implementation of resolutions, programs, plans, schemes and projects, speed up the progress of building national databases, focusing on 12 databases. National data as a foundation for building e-government, including: National population database; business registration; finance; insurance; national land database; administrative procedures; Social Security; nationwide electronic civil status database; resources and environment; about cadres, civil servants and public employees; on planning, national database of investment projects and national bidding network. Focus on building national digital platforms, divided into 6 groups: Digital infrastructure platform group; core digital technology platform group; digital government platform group; medical, educational, cultural, and social background groups; financial, banking, and business background groups; groups of agricultural, transportation, logistics, industry and trade platforms, with the participation of Vietnamese digital technology enterprises. At the same time, build and complete specialized databases to serve management requirements. Government for industries and fields and support business development.

The second, develop infrastructure to serve state management agencies on the basis of combining the strengths of specialized networks, Internet networks, and data centers to serve interconnection throughout 4 administrative levels; using encryption mechanisms and technology to ensure network safety and security owned by Vietnam in a safe and secure manner. State agencies focus on promoting the provision of online public services on smart mobile devices so that people and businesses can have the best service experience, fast, accurate, paperless, and reduce costs. Fees. At the same time, restructure the information technology infrastructure of ministries, branches and localities, convert information technology infrastructure into digital infrastructure, apply cloud computing technology to serve connection and management. Manage resources and data of state agencies safely, flexibly, stably and effectively. In addition, the application of the latest technology in social media, providing information and public administrative services simply and conveniently on mobile, big data analysis, artificial intelligence, virtual reality/augmented reality to carry out comprehensive digital transformation of the direction and administration of state agencies and provide the best and friendliest experience for users.

The third, test the effective deployment of a number of services on the smart urban platform, test the smart urban monitoring and operating center, and select typical urban areas of provinces and cities for trial deployment. Experience, linking the development of smart urban services

with the e-government system, sustainable development according to the circular economy model.

The fourth, build a program to raise awareness and train skills on digital transformation and develop digital government for officials, civil servants, public employees and workers. At the same time, attract highly qualified human resources in information and communication technology to work in state agencies. The nature of digital transformation is people-centered. Therefore, in the process of digital transformation, Vietnam needs to gradually equip people with means, through universalizing smart mobile phones, aiming for one smartphone for each person, each household. Family of a fiber optic cable line. Thanks to digital transformation, digital citizens have the ability to access digital information sources, the ability to communicate in the digital environment, basic digital skills, buy and sell goods online, and ethical standards in the digital environment, physical and psychological protection against influences from the digital environment, rights and responsibilities in the digital environment, identification and authentication, personal data and privacy in the digital environment. Digital transformation brings equal opportunities for people to access services, bringing a series of great advances in quality of life. People can live healthier lives thanks to timely medical care and have more fun with diverse and safer forms of entertainment.

The fifth, continue to promote economic modernization and private sector development. Developing and modernizing the private economy is a factor that not only ensures the maintenance of high GDP growth rates, creating revenue for the state budget, but also participates in solving a series of social problems such as create jobs, eliminate hunger, reduce poverty, and develop human resources. The weakness of the private sector is considered a major bottleneck of the economy in the development process. Thanks to digital transformation, the private economy will continue to grow, becoming one of the main factors creating rapid economic growth.

Sixth, encourage and create conditions for business households to expand their scale, improve operational efficiency, voluntarily associate to form cooperative organizations or convert to business operations according to the model. Modern businesses, using online platforms and the Internet. Digital transformation encourages production to rely mainly on large-scale enterprises, cooperatives and farms, applying high technology. Focus on developing industries and agricultural support services. Promote and improve the effectiveness of vocational training for farmers. Ensure mechanisms and policies to encourage and support economic development in accordance with market mechanisms and promote autonomy and competition. Develop strongly, smoothly, and synchronously, and at the same time take effective measures to protect the domestic market in association with promoting the development of the international market in accordance with international commitments. Ensuring healthy competition in the market. Expand market participation and promote fair competition.

4.2 For businesses

Digital transformation is a revolution in thinking, requiring businesses to proactively innovate and create based on the normative framework and principles of the digital transformation process to shape strategies and models. Transformation model suitable for businesses. Regarding the

overall approach, businesses need to continue to raise awareness, understanding, and focus on the task of investing and developing digital infrastructure and digital platforms. In particular, businesses, typically telecommunications businesses and digital technology businesses, need to pioneer and create diverse digital applications to serve different industries and fields.

Regarding specific implementation, businesses need to focus on:

Firstly, continue to increase awareness and understanding of digital transformation. To successfully implement digital transformation, businesses need to be provided with sufficient information to properly understand and choose an effective digital transformation strategy and roadmap. Regarding orientation, it is necessary to affirm that the business strategy of the enterprise is the most important. Digital transformation must be carried out based on the capacity and current situation of the enterprise and must aim at the ultimate goal of improving the business performance of the enterprise.

Secondly, dual transformation efforts, combining digital transformation and green transformation. In the current context, Vietnamese businesses not only face difficulties in production and business activities, but are also facing requirements to comply with "green" fences set up by countries. Typically, the Sustainable and Circular Textiles Strategy (EUSST) issued by the European Union in June 2022 creates major impacts on textile manufacturers in Asia, the region that supplies more than 70% of garment products go to the European Union (EU). Besides, in the field of agriculture, from the end of 2024, the European Union (EU) bans the import of coffee grown on land originating from deforestation, causing forest degradation. This sets requirements for green production and traceability of origin. At the 2021 United Nations Climate Change Summit (COP26), Vietnam made a commitment to achieve net zero emissions by 2050.

If Vietnamese businesses do not quickly catch up with this trend, the door to the EU market and other major markets will close. Therefore, businesses need to carry out dual transformation, combining digital transformation and green transformation. Digital transformation activities of businesses will contribute to achieving the goals of green transformation and vice versa, green transformation based on the use of new, modern, environmentally friendly technology will encourage the development of new technologies. New, green, and low-emission business model. Therefore, with the support of the Government, it is necessary to establish a Carbon Credit Exchange in accordance with the domestic and international carbon credit exchange and clearing mechanism, in accordance with the provisions of laws and treaties. International community of which Vietnam is a member.

Thirdly, develop a platform of smart devices connected to the Internet for shared use by businesses in Vietnam. According to forecasts, by 2030, globally there will be about 30 billion smart devices (IoT) connected to the Internet to develop smart applications to serve personal needs or different industries such as healthcare. Smart, smart education, or smart urban. The common point of these application developers is that they all need to connect and manage devices. Developing an IoT device platform requires a huge amount of resources. For small-scale innovative technology businesses, this is a barrier that

prevents Make in Vietnam smart applications from being developed. Therefore, Vietnam needs to develop a shared IoT device platform, creating a space for connection and communication between smart devices. With a shared IoT device platform, innovative technology businesses can focus resources on developing business models, providing products and services faster to customers.

Large technology enterprises, especially those with advantages in developing digital and telecommunications infrastructure, need to promote their role in developing a shared IoT device platform. The Ministry of Information and Communications evaluates, approves and announces the national IoT platform, meeting common international connection and communication technical standards.

Fourthly, businesses need to identify advantages in the Vietnamese context and develop digital applications to meet the needs of digital transformation. Digital applications can serve and meet the needs of one, several, or different groups of users and customers. In particular, the spectrum of user needs can expand and change. Therefore, businesses need exploration, creativity and development. Businesses need to identify and discover potential customer groups. For example, from a population perspective, Vietnam is a potential market with 100 million people. Or from the perspective of tourism management and business, Vietnam has about 38 thousand accommodation establishments, 5 thousand amusement parks, and 80 golf courses nationwide. Or from the perspective of industrial digital transformation, Vietnam has about 7 thousand garment factories. Therefore, from each different perspective, businesses need to identify potential customers and digital transformation needs specific to each industry and field. Accordingly, Vietnamese businesses need to understand the Vietnamese context to identify great advantages in meeting the digital transformation needs of these customer groups.

Fifthly, for sustainable digital transformation, businesses need to combine three elements: People, process and technology. In the digital age, almost everyone is exposed to technology. Expectations of what can be achieved digitally have increased, as people interact through different mechanisms, organizational cultures are also changing. All three elements must balance each other and promote the new state. The three factors can exist independently, but they influence each other, meaning that the actions of one factor have the potential to impact the other two. If you change any factor, for example technology, you will see changes in people and processes. Therefore, when considering the digital transformation process towards sustainable development, businesses use the principle of considering the elements as three planets orbiting each other. They use attraction and repulsion to maintain balance. Of the three factors above, people are the main resource and bind the remaining factors because people need the most time to change. When embarking on change, businesses need to consider cultural impacts and design an overall strategy to ensure all three factors bring about synchronized change. Technology solutions need to be legacy, adaptable, responsive to process and cultural needs, and able to change and update. Cloud-based platforms and services enable organizations to quickly adapt processes and ways of working while ensuring safety and security.

5. Conclusion

Digital transformation comprehensively changes the

lifestyle of each individual, the business model and operations of each enterprise, and the way the Government operates by applying digital technology, thereby creating new values. New values and future development opportunities for Vietnam. Digital technology applications can help economic and social development, increase resource management, reduce waste, enhance fairness and equality in society, thereby promoting sustainable development. Solid. For Vietnam in the current context, identifying digital transformation trends in the world's general development associated with Vietnam's characteristics, to redefine the entire vision and development orientation of the country has extremely important for both businesses and the Government to take advantage of opportunities to stay ahead of trends and develop into a digital, stable and prosperous nation in the coming time

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7. References

1. Ministry of Information and Communications. National digital transformation report 2022, Hanoi, 2023.
2. Ministry of Information and Communications. National digital transformation report 2023, Hanoi, 2024.
3. Cisco. 5G development, 2019.
4. Department of Enterprise Development. Program to support businesses in digital transformation for the period 2021-2025, 2023. Accessed January 20, 2024, <https://digital.business.gov.vn>
5. Cybersecurity Drive. Cybersecurity spending on pace to surpass \$260B by 2026, 2022. <https://www.cybersecuritydrive.com/news/security-spending-balloons/634365/>
6. Facebook Bain, Company. Vietnam: New E-Commerce Hotspot in Southeast Asia by 2026, 2021.
7. Fortune Business Insights. Market Research Report, 2023. Link: <https://www.fortunebusinessinsights.com/digital-transformation-market-104878>
8. Google, Temasek, Bain, Company. E-conomy SEA 2023, 2024.
9. IFR. World Robotics 2023 Report: Asia ahead of Europe and the Americas, 2023. <https://ifr.org/ifr-press-releases/news/world-robotics-2023-report-asia-ahead-of-europe-and-the-americas>
10. Markets, Markets. Digital Transformation Market Size, Trends & Growth Report – 2030, 2023.
11. Nguyen Dinh Trung, *et al.* Digital transformation, AI applications and IoTs in Blockchain managing commerce secrets: And cybersecurity risk solutions in the era of industry 4.0 and further, Webology. 2021; 18.
12. Nguyen Dinh Trung, *et al.* IoTs, machine learning (ML), AI and digital transformation affects various industries-principles and cybersecurity risks solutions, Webology. 2021; 18.
13. Nguyen Thi Hang, *et al.* IOT Impacts and Digital Transformation at Listed Vietnam Banks, Webology. 2021; 18.
14. Hang NT, *et al.* Educating and training labor force under Covid 19: Impacts to meet market demand in Vietnam during globalization and integration era, JETT. 2021; 12(1):179-184.
15. Statista. Users of various mobile payment apps in

- Vietnam in 2020, with forecasts to 2025, 2021.
16. Thi Hang Nguyen. Transforming the university management model in the concept of digital transformation, Revista Geintec-Gestao Inovacao E Tecnologias, 2021; 11(3).
 17. Trustwave SpiderLab. 2023 Financial Services Sector Threat Landscape: Trustwave Threat Intelligence Briefing and Mitigation Strategies, 2023.
 18. Trustwave SpiderLab. 2022 Trustwave SpiderLab Telemetry Report, 2022. <https://www.trustwave.com/en-us/resources/blogs/spiderlabs-blog/2022-trustwave-spiderlabs-telemetry-report/>
 19. Vu Thi Thuy Dung *et al.* Enhancing the capabilities of students after graduation-a case study at university of economics and business administration-thai nguyen university, vietnam, Elementary education online. 2021; 20(4).
 20. Prime Minister. Decision No. 645/QD-TTg dated May 15, 2020 on approving the Master Plan for Vietnam E-commerce Development 2021 – 2025, 2020.
 21. Prime Minister. Decision No. 749/QD-TTg dated June 3, 2020 on approving the. National Digital Transformation Program to 2025, orientation to 2030, 2020.
 22. Prime Minister. Decision No. 316/QD-TTg dated March 9, 2021 on approving the pilot application of telecommunications accounts to pay for small value goods and services, 2021.
 23. Prime Minister. Decision No. 411/QD-TTg dated March 31, 2022 approving the National Strategy for developing the digital economy and digital society until 2025, with a vision to 2030, 2021.