



Original Article

# Impacts of Digital Transformation on Manufacture in Vietnam

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**Abstract:** Digital Transformation is becoming a common term in all economic and social sector, which is often understood as the process of changing from a traditional business model to a digital one by applying new technology such as Big Data, Internet of Things (IoT), Cloud computing (Cloud),... aiming to change the operating method, leadership, working process and company culture. Besides, market trends and consumer behavior are changing rapidly, all industrial sectors have to face enormous challenges and fierce competition, in which the manufacturing sector is not an exception. In the complicated context of the COVID-19 epidemic, the role of digital technology in production and business activities, become more significant than ever before due to limitation in transportation and logistics. In the brutal context of the epidemic, digital transformation is regarded as a "vaccine" for the economy. It is necessary to have a deep understand about the impacts of digital transformation on manufacture to suggest some solutions to promote socio-economic development, contributing to the fight against the epidemic and economic recovery.

**Keywords:** Impacts, Digital Transformation, Vietnam.

## 1. Overview of Manufacture in Vietnam

The manufacturing sector is considered to be the main growth driver of the Vietnamese industry as a whole. In 2022, this sector plays a leading role in the economy with a growth rate of 9.5%, contributing 86 percent to the country's total export value and accounted for more than 25% of national GDP [1]. Manufacturing sectors currently develop positively in line with the orientation of industry restructuring. Key

industries such as electronics, textiles, leather and footwear,... grow at a high rate and become a key factor contributing to the development of Vietnam's industry.

### 1.1. Digital Transformation Trends in the Manufacturing Sector

Digital transformation is the process of using digital technologies to create new or modify existing-business processes, culture, and

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customer experiences to meet changing business and market requirements. In the era of 4.0 revolution, digital transformation becomes a vital requirement with all sectors, especially in the field of manufacturing. However, managers are also faced with how to transform digitally in the context of a technology boom, with an increasing number of integration options that must be aligned with business goals and budgets. The ongoing trends of Digital Transformation in the manufacturing industry still focus on some core strategic objectives, including improving operational efficiency and resilience, identifying cost savings, enhancing customer growth and supply chain integrity. The COVID-19 epidemic has exposed the risks of supply chain disruption of essential products due to overdependence on production centers in some countries. Therefore, the potent trend of investment shifting and global supply chains will bring Vietnam many opportunities and advantages to access potential international markets. Currently, digital transformation is the key for businesses to seize chances for international integration. Digital transformation is the key to Smart Factory implementation while digitization is the stepping stone in carrying out this target. The digitization of data helps businesses solve many painful problems in management and operation.

In order to implement digital transformation in manufacturing, enterprises need to increase the ratio of business automation (also known as BPA), using of digital software connected to enterprise portals to automatically control many overlapping work steps, in order to transform the firms from labor intensive to machinery intensive. Digital transformation help combining practices and techniques to improve skills and income, which reducing costs by saving time in processes. It also decentralizes production by facilitating movement and remote communication to improve operational efficiency and productivity. Besides, digital transformation opens the door to new business and revenue opportunities, allowing the creation of new products and services, which create a competitive advantage for the company by

improving the quality of the products manufactured and increases the speed of response to changes in market demand. If a firm is successful in doing business automation, it can foster a culture of innovation, preparing the company to anticipate any disruption; improve internal integration and collaboration by facilitating cross-departmental communication; support for decision making by deepening data analysis (Big Data) and attract new talent.

## *1.2. SWOT of Digital Transformation in Manufacturing Sector*

### *1.2.1. Strength*

The Flexibility, Creativity and Capacity of Human Resources to obtain new knowledge

In the context of deeper international integration, the requirement for the quality of Vietnamese human resources is to prepare the workforce to be able to meet and benefit from international commitments. Vietnam is having obvious advantages in terms of a golden population structure, abundant labor force, and gradually increasing educational level. Vietnamese young people are smart enough, hardworking, creative and inquisitive, quick to grasp technology. This is the basic foundation that creates developers, coders, etc., capable of catching up very quickly with new technology trends. Therefore, Vietnam is always in the top of countries with growth rates in terms of Internet users, smartphones, and social network users. Vietnam is now investing early to prepare a high-quality human resource. In which, the manufacture and production system must innovate in the spirit of considering science and technology as the main pillar of development.

Moreover, the stable political situation also joins hands to create conditions for production and business to expand and develop. This is a guarantee for coherence to implement consistent economic policy. This has created favorable conditions for Vietnamese enterprises to access new technologies, especially digital technology. They feel safe and free to create digital content. This is the premise for our country to compete

with the world's technology. It is necessary to continue building, developing and perfecting technology and telecommunications infrastructure, enhancing network security, and ensuring safety and security for people and customers. Above all, preparation for information technology infrastructure, internet, 4G bandwidth connection, 5G pilot... should be carefully monitored and effectively committed.

### *1.2.2. Preferential Policies*

In the approved National Digital Transformation program, digital transformation for businesses plays a huge role, which is said to be the most important component of the digital economy. The Ministry of Planning and Investment has developed a program with the goal that 800,000 Vietnamese enterprises can competently apply digital technology, thereby improving productivity, quality and competitiveness, whether large, medium or small enterprises. In 2020, Vietnam has officially announced the development orientation of digital businesses - the "Make in Vietnam" strategy for the first time. The number of digital technology enterprises increased by 28%, reaching nearly 60,000 enterprises and this force is ready to participate in transformation programs [2]. The Government has also advocated a mechanism for testing new policies, products, solutions, services, business models and technologies, such as: Sharing economy, night economy, smart city, timely response to the development requirements. As a result, in recent years, the industrial structure has had positive changes in the direction of industrialization and modernization, gradually reducing the share of low-resource industries and gradually increasing the share of medium- and high-tech ones.

Moreover, late digitization seems to be a disadvantage, but it is a great strength because the Vietnamese economy is not tied to old technologies and has the potential to apply new technologies. The information technology telecommunications industry has created 3G, 4G infrastructure, covering 95% of the country, and will soon deploy 5G, which is an important

foundation of the digital economy in Vietnam. If all Vietnamese people have smartphones, install basic services, as well as promote mobile and online payments, the whole society will transform. This is the historic urge for many industries and manufacturing to reach out to the international market.

### *1.2.3. Weakness*

#### *Relatively low Accessibility of domestic Manufacturing Enterprises*

Many experts claim that domestic enterprises are still slow and not used to innovating. About 80% of Vietnamese businesses are still on the sidelines of digital transformation. Most of Vietnam's industries give scores below 2.5 on a 5-point scale of readiness for 4.0 revolution [2]. According to a study by the Ministry of Science and Technology, the percentage of enterprises having research and development function (R&D) in manufacturing industries is still low, specifically: only 17% in the production of electrical equipment; 15% in the chemical industry; 9% in the food industry; 5-6% in Textile and clothing industry [3]. Research from the World Bank has shown that only 9% of Vietnamese enterprises use computer-controlled machines, less than 1% use advanced technologies while most businesses still use machines controlled by people. Besides, the results also show that more than 75% of small and medium enterprises, 66.7% of large enterprises in the survey are skeptical of the economic benefits when investing in new technologies [2].

The driving reasons are due to limited resources, especially internal resources and support policies. Accordingly, the competitiveness of domestic enterprises is not high, the added value created in the country is still low compared to external countries, the manufacturing industry mainly depends on external resources, and the proportion of highly trained workers is limited. On one hand, slow payback period as well as less attractive profit margins compared to real estate or finance also

lead to the limited investment in production. On the other hand, Vietnam is lacking a complete, synchronous and attractive legal framework, mechanisms and policies to support domestic industrial enterprises to improve their competitiveness and innovate technology. At the same time, there is also a lack of linkage between domestic enterprises and the FDI sector to take advantage of technology transfer and market access.

#### Labor shortage in the COVID-19

The fourth wave of COVID-19 has caused production enterprises to "struggle" due to the shortage of human resources, mainly focusing on Southern enterprises. Manufacturing enterprises are facing problems of the workforce in both quantity and quality as a result of the prolonged social distancing period in many provinces and cities. If the labor market is to be broken, it will require a large amount of cost and time to restore the normal state.

Before the outbreak of the COVID-19 epidemic, the total number of employees working in the EPZs and IZs in Ho Chi Minh City was 288,000 people. When the epidemic broke out, only 720 enterprises in HCMC implemented the "3 on-site" production model with a scale of 64,000 employees [5]. However, businesses performing this model then faced difficulties because of high costs and even stopped producing. All businesses are looking forward to reopening their operations but have difficulty in labor as well as raw material supply. Statistics of HCMC Export Processing and Industrial Zones Authority (HEPZA) show that about 31,000 employees working in HCMC EPZs and IZs have returned to their hometowns, mainly in Binh Duong, Dong Nai, Ba Ria-Vung Tau, Long An,...

In addition, highly qualified labor is considered a key factor contributing to the success of the digital transformation process. However, despite promoting human resource training and also recording some impressive results, in fact, high-quality human resources in recent years are still quite limited, yet to meet new requirements and tasks. The manufacturing

industry itself does not have a strategy or plan to develop high-quality human resources. In real life, the large proportion of untrained workers along with the low quality of training and not reasonable structure of occupations have caused society, on the one hand, a shortage of qualified, capable and skilled workforce, and on the other hand, an excess of untrained and manual labor.

#### 1.2.4. Opportunity

##### *Production Cooperation and Investment Connection*

Up to now, Vietnam has built trade relations with more than 220 partners, of which 71 countries have recognized our market economy status. Vietnam has also joined 15 free trade agreements (FTAs) and been in the negotiation round of 2 FTAs, including "new generation" ones such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Vietnam - European Union Free Trade Agreement (EVFTA), Regional Comprehensive Economic Partnership Agreement (RCEP) [5]. On the basis of signed agreements, the economic, scientific, technical, cultural, social development programs are coordinated to be implemented among member countries. Each member has favorable conditions to exploit optimally the national advantages in the international division of labor, then gradually shift its production as well as import-export structure towards more efficiency. These agreements also facilitate conditions to expand the market share of manufacturing industries, strengthen the development of trade relations and expand two-way trade markets.

Vietnam is considered as one of the fastest-growing economies, the most impressive among emerging economies in Asia, deeply integrated into global trade in recent decades. Although Vietnam's economy cannot be compared with other superpowers, we also have some subjective advantages: political stability; potential human resources suitable for the acquisition and development of digital technologies; ability to strongly attract foreign investment from the world's leading multinational technology

corporations such as IBM, Microsoft, and Samsung. So, our country is now considered to have a very developed production capacity in a number of industries such as phones & components, electronic products, textiles,... At the same time, Vietnam has the objective advantage of being adjacent to an area with the fastest-growing digital economy in the world such as China, Taiwan, and Japan. If the digital economy integration is successful, the reputation of Vietnam, in general, will be enhanced and manufacturing enterprises, in particular, can increase their competitiveness in the international arena.

#### *Opportunity to become a Major Production Center*

Despite the impact of the COVID-19 pandemic, more and more FDI enterprises are looking to invest in Vietnam's industrial zones, especially in localities such as Bac Ninh, Hai Phong, Bac Giang, Thanh Hoa and Da Nang. The geographical location adjacent to the sea, a stable political economy and many attractive investment attraction policies have made Vietnam in general and industrial zones, in particular, become an attractive destination. The trends of foreign manufacturing companies moving out of China, such as Samsung, are believed to be due to the supply chain breakdown that has lasted more than half a year in this country. Faced with that situation, Vietnam and manufacturing enterprises can take

advantage of the technology transfer to apply and improve our own country, promoting added value in the manufacturing sector.

Moreover, over the past time, Vietnam has been considered as one of the countries benefiting the most from the trade conflict between the US and China. Besides, the rapidly increasing competitiveness in the manufacturing sector has also contributed to Vietnam's rise to become an export power in the ASEAN region in particular and Asia in general. In the current situation, with a high vaccination coverage rate of more than 80% with over 65% of the population having received 2 doses. If Vietnam promptly restores production and re-establishes manufacturing lines, factories, and industrial parks, we can completely seize the opportunity to turn up to become a major production center in the region and around the world.

#### *1.2.5. Threat*

##### *High requirements for Infrastructure Investment*

According to the announcement of the World Intellectual Property Organization (WIPO), Vietnam is currently ranked 48th out of 132 economies in the Global Innovation Index 2022 (Global Innovation Index-GII). Although there have been many advances compared to the past, we still have to improve a lot to catch up with countries in the ASEAN region such as Singapore, Malaysia,...

Table 1. Ranking of global innovation index of ASEAN countries

Country	2015	2016	2017	2018	2019	2020	2021
Indonesia	97	88	87	85	85	85	87
Malaysia	32	35	37	35	35	33	36
Philippines	83	74	73	73	54	50	51
Singapore	7	6	7	5	8	8	8
Thailand	55	52	51	44	43	44	43
Vietnam	52	59	47	45	42	42	44

Source: Global Innovation Index.

The development of digital infrastructure is a launching pad for digital transformation in order to promote the digital economy,

contributing 10-20% to the whole economy GDP in the period 2021-2025, especially for the manufacturing sector that contributes the most.

So as to adapt to the new context, businesses are forced to build safe and secure digital infrastructure to transform business models. In addition, enterprises need to develop products and services to meet the new needs of the market; closely connect with partners, improve innovation capacity and competitiveness in the market.

The leaders in the manufacturing industry themselves need to do in-depth research on the infrastructure that can help businesses such as modern, smart Internet of Things (IoT) and postal infrastructure that can participate in the commercial value chain. Electronic and logistics help people get rich and get out of poverty. If this challenge can be addressed, the information technology industry will be able to thrive in the direction of the big data industry, forming new economic driving regions, creating many unique products, services and models, solving domestic problems, and thereby helping Vietnam's manufacturing industry reach out to the world market.

#### *1.2.6. Large Capital Requirement*

Businesses should come up with long-term thinking and strategies because digital transformation requires large capital investments. In the digitalization race, if businesses are not under financial pressure, but transformation activities are not organized in a coordinated way with others will lead to great cost wastage. Digital transformation is equivalent to changing almost all working processes, cultures and operating methods, which requires a large investment capital as well as resources. The concern of manufacturing enterprises when carrying out digital transformation is the fear that the amount of capital spent is not commensurate with the results achieved, or even when the plan is broken, that capital will be considered to disappear. Given the pressure of such a large amount of money, it is completely understandable why companies are still confused. And unfortunately, the cost of technology has never been small. It is necessary

to be very clever and to balance the investment properly to avoid this risk.

The Vietnamese government has coordinated with a number of countries such as the United States, Japan and large organizations such as USAID to assist manufacturing enterprises in accessing financial resources and bank loans through improving corporate governance capacity, financial transparency, building effective production and business plans to meet loan requirements. At the same time, the Government's affirmation of its commitment to creating the most favorable conditions for investors to do stable, long-term and effective work also expressed hopes of stronger investment flows into Vietnam in the coming time. However, the problem of capital has never been simple, sometimes even quite difficult. Having specific and feasible roadmaps and plans in the near future is something that the Vietnamese government itself and the managers of manufacturing enterprises need to pay attention to and stick to if they do not want to be left behind in the process of international economic integration.

## **2. Impacts of Digital Transformation on Vietnamese Manufacturing Sector**

### *2.1. Positive impacts*

#### *2.1.1. Promoting Trade*

Export activities are always among the top priorities focused by the Vietnamese government to promote economic growth. One of the most important characteristics of the export activities is the meeting between potential businesses to create partnerships and form cross-border relationships. Previously, Vietnamese enterprises had to spend a lot of money to participate in trade fairs to find suitable partnerships. The stages in business exchange also faced many difficulties because of geographical distance. Therefore, partnerships were mostly conducted with familiar partners in a close distance such as China, Taiwan, and

Japan. Digital transformation will help businesses cut operating costs by reducing labor and reduce the price, improving the competitiveness of enterprises. This is especially important when businesses need to save capital to fight the pandemic.

Digital interactions are not limited by geographical distance and do not require contact, so exhibitions and online sales sessions will help increase the export value, even helping businesses expand their markets compared to the previous period. This is clearly demonstrated in the chart below since the US is currently the main export market of Vietnam, not the traditional Asian markets like China or Japan anymore. In the process of international economic integration, digital transformation is considered a stepping stone to great progress. Trade promotion activities in the past were organized mostly by bringing goods to different countries, presenting them at fairs or exhibitions. This brings about a high closing rate but requires logistics-related costs, especially bulky items. Moreover, this method is also greatly influenced by geopolitical fluctuations, such as war or special requirements related to religion. Because

of the high cost, the risk is also very high, especially when the offer fails or for some reason, the fair or product show is canceled. For Vietnamese small and medium enterprises, this is a big challenge if they want to conquer new markets.

Thanks for the development of digital transformation, the export turnover of Vietnam has marked a continuous increase despite the COVID-19 pandemic interrupted and stopped many economic activities around the world. During this period, digital transformation is almost a mandatory condition for businesses to continue to put their name on the market. Overall, digital transformation has had a positive impact on export value, helping Vietnamese businesses find foreign partners, thereby maintaining revenue and export value at an acceptable level, even in the most difficult times of the pandemic. Over the past decade, our country's import and export turnover recorded an impressive growth rate and with the policy of building a digital foundation and promoting international economic integration, the manufacturing sector must be thriving in the near future.

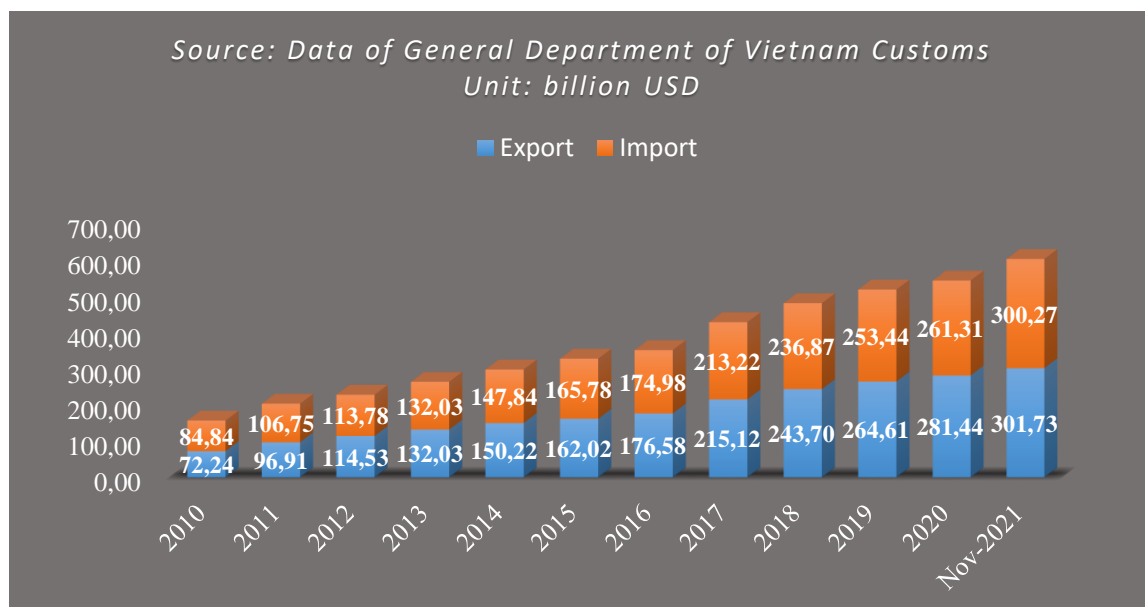


Figure 1. Import and Export turnover (2010 - 2021).

2.1.2. Contribution to GDP Growth

Vietnam currently maintains great strength for transformation, which is reflected in digital infrastructure indicators with more than 61.37 million people, equivalent to 64% of people using smartphones. In addition, according to statistics from the Vietnam Digital report (January 2021), the number of Internet users in Vietnam is 68.72 million, accounting for 70.3% of the population [2]. These are very encouraging rates, showing that the Vietnamese people are almost ready to welcome the advances brought about by digital transformation.

In 2022, the digital technology industry represented a key pillar of the Vietnamese economy, bringing in an estimated revenue of US\$148 billion, marking an increase of more than 10% compared to 2021 and the contribution of the digital economy to national GDP in 2022 accounted for about 14.26% of the total. Ministry of Information and Communications has set a target of raising the contribution ratio of digital technology enterprises to GDP to between 6% and 6.5% annually from 2023-2025.

A total of 1,400 Vietnamese firms are generating revenue from exporting digital technology products covering all fields [6]. Digital transformation can completely help Vietnam achieve the growth target since businesses can save costs, improve performance, increase competitive advantages and help managers have a broader view of their companies. At the same time, thanks to the application of smarter and more efficient production models into operation, the labor productivity of enterprises has been significantly boosted. Aiming to reach 100,000 digital technology enterprises by 2025 and achieve an average growth of 10-20%/year in the export value of Vietnamese digital technology enterprises, the manufacturing industry is expected to contribute 10-20% to GDP growth. Thanks to the application of digital technology, operations and management are streamlined, helping businesses improve performance, thereby contributing to the GDP of the whole country. This process has been accelerated by the COVID-19 pandemic as commerce and services have been digitized in response to social distancing policies.

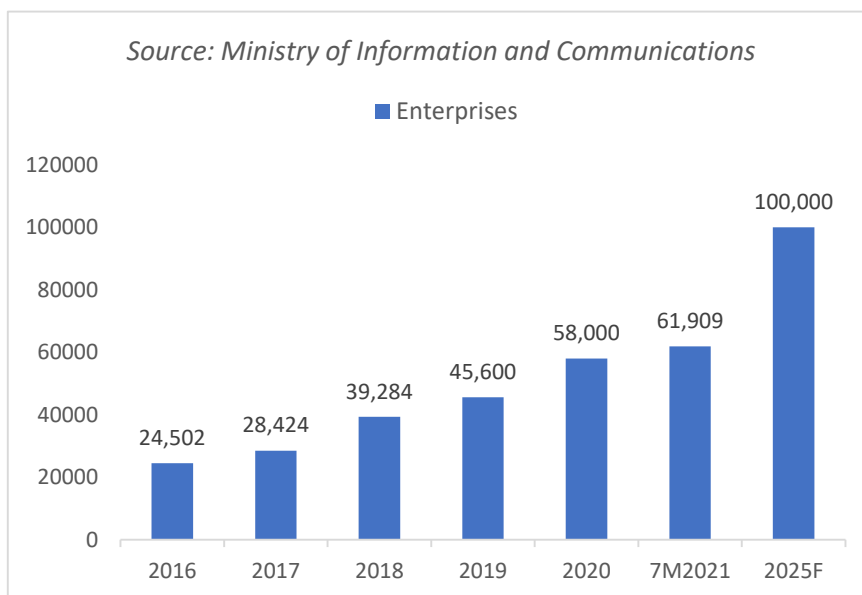


Figure 2. Total number of Digital Enterprises in Vietnam.



### 2.1.3. Improving Management Capability

On the business side, digital transformation is a revolution, directly helping leaders improve their management efficiency and easily control production lines. This is a profound transformation that changes the culture, organization and operations of the business by integrating technologies, processes and working methods at all levels of leadership. With the digitization of management processes, administrators can better understand what is happening to the business, immediately update the actual situation, thereby giving close instructions and appropriate strategy. With lower leadership levels, monitoring and checking employee productivity will be easy, continuous, and inexpensive compared to using paper or people. For example, in some enterprises, worker productivity is now measured by software. Therefore the administrative apparatus have been issued, helping to reduce the costs and time of handling public services. The State identifies three main pillars of the National Digital Transformation program including Digital Government, Digital Economy and Digital Society. Proper awareness and drastic actions have shown certain effects, for example, the number of public services through the Government's portal has increased tenfold, greatly reducing costs and efforts, freeing businesses from complicated administrative procedures. This contributes to the increase of private capacity as well as administrative and financial management capacity. As a typical example, tax administration is always a top priority because it is the main source of revenue for the State budget. Ensuring this revenue source will help the State perform its functions, indirectly affecting the investment and business environment. Effective public administration and finance management will create a favorable investment environment, promote production, and increase the economy's resilience to the pandemic.

### 2.1.4. Market Diversification

On the market, there are countless distribution channels from different

manufacturers, for different products and to different customers. These distribution channels form a bridge between businesses, manufacturers and customers who use products and services. Among the biggest advantages of digital transformation is the presence of manufacturing enterprises in the digital space despite the difficulties of geographical distance. This helps businesses have an additional product distribution channel then diversify outputs. In fact, products that support online transactions such as domestic and international e-commerce platforms are developing very strongly. More and more Vietnamese businesses appear on international sales platforms such as Alibaba or Amazon. At the Cross-Border E-Commerce Matchmaking Conference 2021, Amazon Global Selling announced data showing that the number of products sold by Vietnamese small and medium enterprises on this platform increased by 34% compared to last year. This number in 2021 is expected to reach 7.2 million products. It, therefore, can't be denied that digital transformation helps businesses diversify outputs for products, avoiding being dependent on one channel to prevent unexpected risks such as the Covid-19 pandemic. As a typical example, agricultural production is considered as one of eight priority areas for digital transformation. Up to now, nearly 3.1 million agricultural households across the country have been supported on the Postmart and Voso exchanges. After more than 3 months of implementation, these e-commerce platforms have supported the consumption of nearly 26,000 tons of agricultural products, of which 2,200 tons come from southern provinces and cities. In particular, nearly 3.1 million agricultural households across the country were supported on the e-commerce floor [3].

## 2.2. Negative Impacts

### 2.2.1. Asymmetric Structure

Digital transformation is a process that, although can bring great benefits, requires a high level of gray matter and initial investment rate.

Therefore, for small and medium enterprises, which do not have enough capital, it is easy to be "out of breath" in this race. During the 4th wave of the COVID-19 epidemic, 87% of businesses were estimated to be affected [2]. Many businesses have sought digital transformation to streamline business administration and sales. However, they face a lot of challenges such as lack of information technology background, lack of digital skills, mindset, working culture, and especially difficulty in having human resources to meet the needs of transformation.

The majority of businesses promoting digital transformation are large corporations or foreign-invested enterprises, accounting for 3-4% of the total number of enterprises in Vietnam. Specifically, according to information from automation equipment suppliers Autotech Vietnam, most of their customers are FDI enterprises. Meanwhile, according to the economic survey results of GSO, small, medium and micro enterprises - accounting for nearly 96% - have not taken advantage of digital transformation, therefore, suffer huge losses due to the pandemic and social distancing orders. This not only causes a development gap and asymmetry in the industry structure in general but also causes disadvantages for Vietnamese enterprises in particular.

### *2.2.2. Network Security Risks from Electronic Devices*

More and more information and work processes will appear in cyberspace since digital transformation will change production and business activities. The COVID-19 pandemic has accelerated this progress, shifting many activities to the online platform. While this can increase operational efficiency, it also makes businesses more vulnerable to cyberattacks. In 2020, 23 malwares related to Covid-19 were detected in Vietnam (FPT, 2020). This software, when activated, will give hackers control, leading to risks such as unauthorized access to online meetings, data and business secrets disclosure, directly affecting the viability of the enterprise.

In addition, for manufacturing businesses, the digital transformation that comes with automation will lead to a huge reliance on online systems to keep the line running. Therefore, a small mistake can also greatly affect the chain. These are ideal targets for hackers to attack. According to a report made by VirusTotal and Google, the number of ransomwares in Vietnam in the first 7 months of 2021 has increased by 20% compared to 2020. In particular, the most prominent is the method of attacking industrial control systems. This attack method takes control of the factory, disturbs the chain, and can cause great damage to manufacturing and processing enterprises in our country.

For the State, the consequences of cyber-attacks are much greater. The National Digital Transformation Program consists of three main pillars: Digital Government, Digital Economy and Digital Society. This also means that citizen information, internal news, public administration and other sensitive information will be stored on the National Digital System. Network security still has many limitations despite containing these sensitive, important and influential data. Cases of attacks to get national data have been discovered, many security holes have caused billions of VND in damage to the State. Even, the information can be changed or manipulated to make it difficult for the management of the government apparatus, break the link between enterprises and the State, indirectly reduce business efficiency. This outstanding issue poses an urgent need to improve security and ensure information safety so that enterprises and their boards of directors can rest assured to cooperate in production and business.

## **3. Solutions to Improve Digital Transformation in Manufacture**

### *3.1. For the State*

The first important key for Vietnam's manufacturing sectors to improve their digital transformation is to improve the quality of

institutions and state policies. In order not to miss this opportunity, the Government must self-renovate and transform to become a Government of the 4.0 era, with sufficient capacity to manage national development and especially the management of industrial fields in the digital age. Some possible solutions are as follows:

*First of all*, speeding up the building and perfecting of institutions, creating a full and comprehensive legal basis for the implementation, construction and development of e-Government. According to the experience of developed countries on e-Government, the institutional foundation must go first, while our country still lacks many regulations and policies. Therefore, it is necessary to soon issue decrees on information risk management, data sharing and protection within enterprises, electronic authentication, product data protection, items and guarantee of origin information, the reporting regime between enterprises and state administrative agencies.

*Secondly*, establishing data systems to serve the Government's management and administration process. Accordingly, the Government Office and ministries, branches and localities need to be active in building the National Service Portal and deploying an electronic information system connecting businesses together and with state agencies. This is an important system to demonstrate the Government's spirit. The national public service portal needs to be consistent, complete and user-friendly.

*Last but not least*, reviewing, rearranging and mobilizing all resources, both financial and human. Over the years, the Government has made certain investments in the application of information technology. However, investment projects are still scattered and have not yet made fundamental changes to build e-Government. In the coming time, in order to improve investment efficiency, it is necessary to review, rearrange and mobilize resources to implement the priority tasks of e-Government development, adjust the specific investment mechanism for information technology, strengthen the socialization to

promote the effectiveness of public-private cooperation in the fields of production. At the same time, it is necessary to organize training on the exploitation and use of information systems and online services for businesses and have a mechanism to attract talents to participate in the construction and development of domestic manufacturing industries. Above all, the human factor must play a decisive role. People need to be placed at the center of the digital transformation process because they are the basic, solid foundation of all activities in the business. The overarching digital transformation is that no one is left offline, all need to be digitally connected.

### 3.2. For the Business

Digital transformation for businesses plays a huge role, it can be said to be the most important component of the digital economy.

Each business owner himself needs to have a sense of improving his education level, specialized knowledge, cultural, economic, legal and social knowledge,... Currently, small and micro enterprises account for the largest proportion in our country, most of which go to individual business households or come from the ideas of individual business owners. They may have many business ideas, have sufficient conditions to conduct production activities, but lack a realistic model, knowledge of financial, accounting management, legal risks of enterprises, or even face the "barriers" right from administrative procedures.

It does not come from the perception of administrators only but also from a business perspective in general. In order to improve competitiveness, enterprises need to improve their organizational and management skills, human resource quality, product quality and standards to meet market demands. Enterprises also need to have appropriate strategies to take advantage of production and export opportunities in the current period of economic integration, such as: i) Applying information technology software to business management; ii)

Focusing on improving the quality of inputs, including capital, input materials, human resources, science and technology level; and iii) Launching a strategy of “brand positioning” through building product standards: improving product quality, stable product prices, sales and after-sales policies.

Digital transformation has really brought about great benefits, from economic to social aspects. No field or business can deny its importance, as evidenced by the fact that our country is increasingly accelerating the transformation to develop the national economy, including the manufacturing sector – one of the eight pillars of transformation. Under the pressure of digital transformation and international economic integration, Vietnam's manufacturing sector has shown its advantages and development opportunities such as supporting trade promotion or increasing investment cooperation,... However, besides these significant developments, the industry itself still has limitations and faces many barriers. Therefore, the Government needs to have supervision orientations, build an appropriate legal framework, promote the development of information technology and human resource infrastructure, etc. Domestic enterprises themselves and business administrators also need to be aware of the importance of digital transformation, make good use of the opportunities, and make effort to overcome difficulties as well as challenges to stand firm in the increasingly fierce economic competition and brutal conditions of the COVID-19 pandemic. If the Government together with businesses can come up with a

comprehensive system of policies to promote the positive aspects of the manufacturing sector, and at the same time limit its negative impacts on the economy, the potential for the Vietnamese manufacturing sector to rise in the international arena will be very bright.

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