

DIGITAL TRANSFORMATION FOR THE LOGISTICS INDUSTRY IN VIETNAM

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Abstract: *Logistics is a service chain activity from the pre-production stage until the goods are distributed to the consumer. Today, the development of the digital economy leads to strong competition between businesses. Especially due to the impact of the COVID-19 pandemic and the Russia - Ukraine conflict, the supply chain was disrupted and reversed. Many logistics businesses have difficulty and have a negative impact on the economy. This cause required promoting the digital transformation process in the logistics industry in general and logistics businesses in particular to take advantage of scientific and technological achievements to improve corporate management, and competitiveness, reduce cost, and bring high efficiency to businesses.*

• Keywords: *digital transformation, logistics, COVID-19, Russia-Ukraine conflict, Vietnam.*

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1. Introduction

Due to the impact of the COVID-19 pandemic, along with global risks, and economic and political instability in recent years, both domestic and international trade have faced difficulties. In response to the challenges posed by the recent epidemic and to capitalize on the ongoing digital revolution, Vietnamese logistics services need to undergo a swift digital transformation. This revolution presents both challenges and opportunities for businesses, urging them to transform traditional production organization methods.

The article focuses on researching digital transformation in the logistics industry in Vietnam using qualitative methods through document research. The data used in the article is compiled from secondary sources, including Government decisions and plans, logistics reports from the Ministry of Industry and Trade, Vietnam Report, and other relevant sources.

2. Literature review

2.1. An overview on logistics and digital transformation

An overview on logistics

Christopher (1997) defined logistics as the strategic management of the procurement, transportation, and storage of raw materials, parts, and finished goods inventory, along with the flow of related information through an organizational process. It involves the organization and implementation of marketing

channels. Logistics extends beyond handling or transportation; it also encompasses a combination of activities such as communication, customer service, localization, and logistics (M. Christopher, 1997, and M. C. Cooper, 1997) and is closely related to trade and production planning (Lambert, 2008).

In 2001, the Council of Supply Chain Management Professionals introduced a precise and comprehensive concept of logistic as a part of the supply chain cycle, including the processes of planning, implementing and controlling effectively the storage and flow of goods and services, two-way communication between the point of origin and the point of consumption to meet customer needs.

The Commercial Law in 2005, for the first time introduced the concept of logistics as commercial activities, followed by traders carry out one or more task including receiving goods, transporting goods, storage, customs clearance, other paperwork, customer consulting, packaging, marking, delivery or other services related to goods according to negotiate with customers to receive remuneration. Logistics services are transliterated in Vietnamese as logistics services (Article 233).

Although there are many different perspectives, concepts of logistics services can be divided into two groups:

(i) *The first group* (narrow definition) considers logistics to be almost similar to goods transportation activities.

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(ii) *The second group* (broaden definition) considers that logistics has an impact from the pre-production stage until the goods reach the final consumer. Accordingly, logistics services are associated with the process of importing raw materials as inputs for the production process, producing goods, and putting them into circulation and distribution channels to the final consumer. Thus, a professional logistics service provider requires expertise to provide “full package” services to manufacturers. This is a highly specialized job.

Digital transformation in logistics

Logistics digital transformation is the process of applying digital technology to activities in the supply chain with the aim of overcoming stagnation, creating breakthroughs to enhance competitiveness, reducing logistics costs, expanding customer base, and achieving maximum profits superior to those before the digital transformation.

According to the Ministry of Planning and Investment (2021), digital transformation in businesses is defined as “the integration and application of digital technology to improve business efficiency, management efficiency, and competitiveness.” of businesses, creating new values”.

In conclusion, digital transformation in Vietnamese logistics businesses is the process of logistics businesses applying digital technology and exploiting the digitalization process to improve corporate management, innovate operating methods and service quality, develop relationships between partners with businesses, customers, value chains, and business ecosystems to adapt to the changing requirements of the market and the economy.

2.2. Benefits and platform technology in digital transformation for the logistics industry

2.2.1. Benefits of digital transformation for the logistics industry

** Increased Efficiency*

Digital transformation in the logistics field will help improve efficiency in transformation activities. Real-time shipping rates, paperless orders, and maximum automation of processes will significantly improve operational efficiency. To do this, logistics businesses need cloud-based software from vendors that allows for centralized tracking and recording of transactions. With the help of this technology, logistics companies can provide customers with

detailed progress information to ensure the best performance and quality.

** Facilitates Trust Among stakeholders*

The logistics industry is taking a big step forward by integrating blockchain-enabled digital shipping solutions within companies. This move builds trust between partners and helps the industry realize its ambitions for greater technological advancement.

Digital transformation in the logistics sector has made it possible for customers to track their orders from start to finish, delivering the benefits of saving both time and money. When people want to know when they can expect their shipment or if any changes have occurred, they don't need to ask anymore; they can go online or receive automated messages with all the relevant information. Additionally, when all parts of the process are fully informed, everyone benefits: trust increases and obstacles decrease.

** Enhanced Routing*

Investment in advanced software has led to a major change in the logistics industry - improving routing. Thanks to digital transformation in supply chains and logistics, drivers can easily identify the most efficient routes with minimal navigation risk and delays. If there are congestion issues such as road works or traffic accidents, alternative routes will be suggested to reach your destination without delay. Financially, this technology helps logistics companies save money by allowing vehicles to use shorter routes, drive fewer kilometers, and consume less gasoline.

** Intelligence in Transportation*

Logistics processes have seen an increase in data since the digitization of operations. Therefore, businesses should consider investing in advanced analytical techniques to make better decisions in the logistics industry. AI and Cognitive Computing software development services are necessary to make informed decisions about marketing strategies. However, they can also provide supply chain management services, process optimization, cost savings, improved customer experience, and enhanced end-to-end communication.

** Preventive Fleet Supervision*

AI-powered predictive maintenance in supply chain and logistics is a boon for companies. It allows them to identify vehicle problems and take preventative measures remotely. By identifying vehicles in need of repair early, teams can quickly

respond to minimize downtime, significantly reducing costs. It brings cost benefits and customers know that the logistics company provides reliable services giving them peace of mind.

2.2.2. Platform technology in digital transformation for the logistics industry

Digital transformation in logistics businesses depends on scientific and technological advances. Currently, depending on the scale, needs and capabilities, businesses apply technology at different levels, which may be related to popular arts such as: Blockchain, Internet of Things. (IoT), Artificial Intelligence (AI), Cloud Computing, Big Data and Data Analytics, Warehouse Automation (Warehouse Automation) and Robotics. This shift helps logistics businesses speed up innovation, make better decisions, engage customers throughout their journey, incorporate organizational agility, and increase automation.

3. Results and Discussions

3.1. Achievements in logistics digital transformation in Vietnam

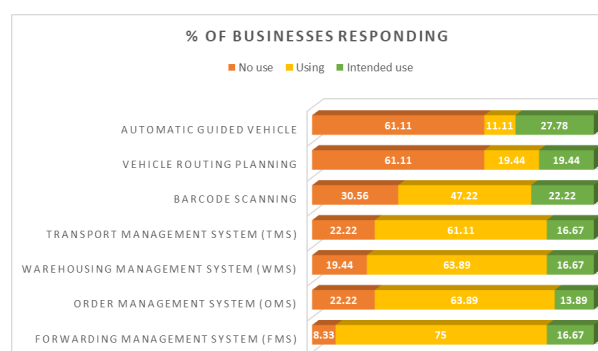
The logistics industry has long been a key service industry with high added value, serving as a foundation for trade development and improving the competitiveness of the economy. According to the Vietnam Logistics Service Business Association (VLA), the growth rate of the logistics industry in Vietnam in recent years has reached about 14%-16%, with a scale of about 40-42 billion USD/year. However, the ratio of logistics costs to Vietnam's national GDP is 18% of GDP, while this figure in developed countries is only 9-14%. That just shows that Vietnam's logistics costs are still quite high compared to other countries in the region such as China, Thailand... The reason may come from limitations in seaport infrastructure associated with post-port services; Logistics infrastructure planning, including seaports, inland ports, logistics centers, depots, truck parking lots, container trucks... is not effective.

Therefore, applying digital technology is a necessary requirement to cut costs. Additionally, logistics digital transformation will help improve efficiency in transportation processes. Real-time freight rates, paperless bills of lading, and maximum automation of processes will significantly enhance operational efficiency. Digitalization in the logistics industry is a transparent and effective solution to help reduce difficulties caused by supply chain

disruptions since the outbreak of Covid-19 and the Russia-Ukraine conflict.

Logistics businesses have correctly recognized and appreciated the importance of digital transformation for production and business activities. According to Vietnam Report (2022), 100% of logistics businesses have increased investment in digital transformation, of which 86% of businesses expect the application of digital technology and digital transformation will bring significant benefits in terms of productivity and business performance in the future, 36% of businesses believe that introducing technology into the logistics journey will enhance global customer experience. The level of application of digital technology in logistics businesses is increasing and becoming a key trend in businesses' strategies. Logistics businesses have made certain progress in the digital transformation process. Specifically, in addition to technology platforms that have been around for a long time and are commonly used in the activities of logistics businesses, emerging technology platforms have been applied by businesses, of which there are about 68% of logistics businesses have deployed digital transformation platform technology applications in business operations such as IoT (19.4%), cloud computing (18.4%), artificial intelligence (18.4%), blockchain (14.3%), big data and analytics (7.1%), warehouse automation (10.2%) and Robotics (12.2%).

Information technology applications and application trends in logistics businesses



Source: Vietnam Report, 2022

With the unwanted effects of the COVID-19 pandemic and the Russia-Ukraine conflict, 58% of logistics service providers have shortened their technology roadmap, the proportion of businesses with high and very high levels of technology application is increasing rapidly in many fundamental technologies, of which robotic process automation (RPA) reaches 100%, big data reaches 80%. All stages of logistics business operations

have also begun to apply digital technology, of which 75% of businesses are using FMS (freight management software); 63.89% of businesses are using OMS software (order management software) and WMS (warehouse management software); 61.11% of businesses are using TMS (transportation management software); 47.22% of businesses use barcode scanning; 19.44% of businesses use Vehicle routing planning and 11.11% of businesses use Automatic Guided Vehicle.

According to the Vietnam Logistics Service Business Association (VLA 2022), the application of science and technology to logistics activities is not synchronous, but is initially effective. Vietnamese logistics businesses are providing from 1-17 different types of logistics services according to regulations in Decree No. 163/2017/ND-CP. The main services are forwarding, transportation, warehousing and customs declaration. About 46% of businesses are applying different types of technology, depending on the scale and nature of each business's service, bringing high efficiency in business. Notable among them are customs declaration services (almost 100% electronic), tax payment (100% electronic invoices), seaport operation management services, and freight vehicle itinerary management, warehouse management,... However, digital transformation in the logistics field is still facing many difficulties such as lack of connectivity in the system, lack of information about digital technology, lack of digital technology infrastructure and lack of internal human resources to apply digital technology, difficulties in investment costs, application of digital technology, difficulties in changing habits and business practices, low service quality... In addition, about more than 90% of small and medium-sized enterprises have difficulty choosing technology suitable for their service activities.

3.2. Challenges in logistics digital transformation in Vietnam

In the effort to digitally transform logistics, many difficulties and challenges still exist. In particular, we must mention:

• Finance

Financial potential is one of the challenges in logistics digital transformation in Vietnam today. According to a report by the VLA, 90% of Vietnamese logistics businesses have capital of less than 10 billion VND, 5% have capital of 10 - 20 billion VND. With such a capital scale, investing

in expensive digital technology solutions is very difficult.

Digital technology solutions in logistics often require large investments in infrastructure, equipment, software and human resources. For example, to deploy a smart warehouse management system (WMS), logistics businesses need to invest in barcode scanner systems, handheld devices, WMS software, etc. The cost for these solutions can reach billions of dong. In addition, digital transformation also requires logistics businesses to have a workforce with high professional qualifications and technological skills. However, this human resource is currently still limited in Vietnam. Therefore, financial potential is a big challenge for Vietnamese logistics businesses when implementing digital transformation.

• Technology

In general, Vietnam's logistics industry is still quite backward in technology, especially in small and medium enterprises. These businesses often use manual, traditional methods in management and operations, leading to low efficiency, high costs and lack of flexibility.

Having a workforce with technological knowledge and skills is an important factor in the logistics digital transformation process. However, in Vietnam, there is still a shortage of human resources with high professional qualifications and technological skills. This can create challenges in implementing and managing new technology solutions. Besides, the application of new technology also raises issues related to information security and privacy.

• Human

Human resource shortage: The demand for logistics human resources is increasing, while the supply cannot keep up. According to a report by the VLA, by 2030, the need for Vietnam Logistics human resources will reach about 200,000 people, while currently only meeting about 10% of the need.

Human resource level does not meet requirements: Most of the current logistics human resources have not been properly trained in digital transformation. They lack knowledge and skills about new technologies, such as artificial intelligence (AI), machine learning (ML), big data,...

Afraid of change: Some logistics employees are afraid of change and afraid of learning new technologies. This leads to them not actively

participating in the digital transformation process of the business.

- *Lack of cooperation between logistics businesses*

Lack of uniformity in applying common standards and protocols can reduce the ability to interact and integrate between systems and platforms of logistics businesses. Impacts the ability to exchange information, manage data and optimize processes.

Logistics businesses can use different systems and technologies, from manual processes to automated distribution or warehouse management systems. This difference makes integration and information sharing complex, requiring a lot of effort to achieve compatibility. Besides, in a competitive environment, logistics businesses may tend to keep information and data to themselves, not wanting to share with competitors. This can cause lost opportunities to create added value through information sharing and multilateral interactions.

- *Highly dependent on old, outdated systems*

Relying too much on old systems is a big challenge in logistics digital transformation. These systems are often inflexible, unable to scale and integrate with new technologies. This over time leads to problems such as:

Lack of efficiency: Legacy systems are often slow, inaccurate, and unable to automate processes. Wastes time, costs and human resources.

Lack of adaptability: Failure to respond to rapid market changes, leading to loss of customers and business opportunities.

Lack of security: Legacy systems are often vulnerable to security attacks, leading to loss of data, assets and business reputation.

4. Recommendations and solutions

4.1. Recommendations

It must be affirmed that the successful application of IT and digital transformation in enterprise logistics is a decisive factor in the development of logistics services to meet the needs of improving the competitiveness of our country's import and export goods. in the context of the current strong development of e-commerce, adapting to the global supply chain being seriously disrupted due to the COVID-19 epidemic, military conflict between Russia and Ukraine as well as climate change causes.

According to the Agility 2022 rankings, Vietnam's logistics market is ranked 11th in the group of 50 global emerging logistics markets. The compound

annual growth rate (CAGR) for the period 2022-2027 of Vietnam's logistics market is forecast to reach 5.5%. Vietnam is currently the leading country among ASEAN countries in the number of logistics service businesses licensed by the US Maritime Administration (FMC).

The trend of digital transformation is becoming increasingly popular and accelerated. In particular, in the logistics industry, technology does not stop with "track & trace" - control and monitoring, but many businesses are looking for ways to display their entire supply chain. According to a survey by Alloy Technologies, 92% of logistics company executives believe that supply chain management ability is an important factor for success. However, only 27% of them have found a way to successfully digitally transform their businesses. This shows that digital transformation is an inevitable trend in the logistics industry, but not all companies are capable of successful digital transformation. So what solution helps digitally transform the Logistics industry in Vietnam?

4.2. Digital transformation solutions for the logistics industry in Vietnam

4.2.1. Solutions from state management agencies

- Propose the implementation of an action program to improve the application of modern Science and Technology. The focus is on investing in digital infrastructure to meet the increasing demand for connectivity and data processing. Stimulate cooperation between Information Technology corporations to build and transfer logistics software to businesses in Vietnam at preferential prices, to create opportunities to use and participate in transformation activities in a fair and comprehensive manner.

- Research and apply advanced technologies and techniques in management, operations and training in the field of supply chain and logistics services. Encourage and guide businesses in a number of industries to apply advanced supply chain management models in production and business.

- Propose to issue preferential policies on taxes, land rental and loan interest rates, to support logistics businesses to invest in warehouse networks and automatic goods classification systems.

- Continue to improve the legal framework on logistics services, especially security issues and cooperation in preventing cybercrime. Integrate network monitoring functions, ensuring network safety and security right from the design and

construction stage. Research, amend and promulgate new policies and laws regulating logistics services, multimodal transport, and cross-border transport in e-commerce.

- Strengthen the connection and cooperation between state agencies, organizations and businesses, including associations and organizations in the Information Technology and Logistics industries, to create synchronous efficiency in comprehensive digital transformation efforts.

4.2.2. Solutions from the businesses

- Change thinking and vision: Businesses operating in the field of logistics need to be clearly aware of the urgency of digital transformation and consider it an inevitable factor if they want to maintain their position in the market. In particular, the most important factors of this great event lie in people, thinking and culture. Changing thinking about digital transformation must start from the leadership level. Coordination between logistics businesses, associations and universities to provide a knowledge base for human resources in the industry is also very important.

- Ensure a clear and appropriate roadmap: Digital transformation needs to be implemented firmly and follow a roadmap suitable for each specific business. This transformation process takes place from digitizing data, to digitizing processes, changing business models to digital platforms suitable for automation processes. In each stage, businesses need to plan carefully, choose appropriate processes, find reliable suppliers in terms of reputation, quality and financial capacity to build a linked digital system with common standards and easy data retrieval.

- Investing in technology, changing management methods: Investing in technology and changing management methods will help logistics businesses compete fairly with foreign competitors, even have an advantage. For small logistics businesses, they can participate in niche markets, small scale and simple product categories, to serve retail businesses, individuals doing business online on social networks or mobile application platforms. The niche market will be consistent with the scale and quality requirements of logistics services of these businesses.

- Building human resource strategies: Logistics businesses need to develop strategies and plans for training, recruitment, and use of human resources appropriate to the conditions of the business, through building a system of criteria, cooperating,

linking, and sharing resources with training facilities in the logistics industry to recruit and order training according to business needs. In addition, businesses proactively build facilities, implement internal training programs, and encourage officers and employees in the business to self-study and accumulate knowledge and experience in applying information technology into practice.

- Research thoroughly and seek advice: Logistics businesses need to research meticulously and thoroughly to choose the appropriate digital transformation model. This includes learning about new technologies and seeking advice from digital transformation service providers to determine the best direction. The ability to interact closely with businesses in the logistics industry and seek cooperation from partners with strong financial backgrounds can help improve the financial viability of businesses. Thereby providing stable resources to develop technology and attract high-quality human resources.

- Synchronization and flexibility: During the digital transformation process, businesses need to transform in a consistent and flexible way. This helps connect stakeholders in the chain, including ports, carriers, agents, forwarding companies and warehouses, to share data and increase chain efficiency. At the same time, prioritize investment in necessary modules that allow the integration of digital technologies, to comprehensively synchronize business systems in a sustainable manner.

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