

# Sustainable Development of Logistics in Vietnam in the Period 2020–2025

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Globally, logistics has entered a boom period, but in Vietnam the logistics industry is still in its infancy, although the country has focused much more on developing this service industry in recent times. In Vietnam, logistics and the new, complete and comprehensive content of logistics constitute a relatively new field, including both theoretical systems and practical operations. Enterprises specialising in providing logistics services only partly meet the needs of the domestic market, and have not yet reached regional and world markets. Hard and soft infrastructure conditions for the development of this service in Vietnam are very limited. Other relevant laws, such as the Maritime Law and the Transport Law, lack many guiding decrees. Financial and customs issues related to logistics services are still inadequate. Highly qualified human resources in the field are also seriously lacking. In particular, a new revolution is taking the entire economy to join – the Industrial Revolution 4.0. This is not associated with the birth of any specific technology, but rather has emerged from the convergence of many different technologies, in which the focus is on nanotechnology, biotechnology and information technology. The Industrial Revolution 4.0 requires industries in society to transition to a smarter approach to meeting the needs of society. With an important role in the development of businesses in particular and Vietnam in general, logistics must also keep up with the trend of this digital age. This article focuses on researching the factors that can affect logistics activities in Vietnam, especially under the impact of international economic integration and the Industrial Revolution 4.0. It proposes highly feasible solutions to the factors that have negative and positive impacts on Vietnam's logistics market.

**Key words:** *Logistics, sustainability, Industrial Revolution 4.0, Vietnam*

## Introduction

For the past 20 years, with an increasingly important role in determining competitiveness, logistics has attracted the attention of many researchers. Studies on logistics are diverse, involving many aspects, and are conducted under a variety of different perspectives. Islam and

colleagues (2013) present the theoretical issues of logistics management in enterprises (logistics concepts, logistics activities related to customer service, procurement, processing, inventory management, packaging, transportation). They mention global logistics when businesses enter foreign markets, issues related to transportation, finance, strategy, construction, management of information systems and the organisation of effective implementation of logistics activities. Adewole and Struthers (2018) examine international logistics related to the movement of goods between the parties in two or more countries. The authors analysed the government's interests in international trade and transport, noting the national differences in international logistics (differences in management, values, customs clearance). Their research deals with issues related to the international logistics activities of businesses: international transport, payment terms, conditions of sale and delivery, distribution channels (Jeevan, 2018).

Tongzon and Lee (2016) address the core elements of micro logistics, measuring the value of the effectiveness that logistics brings to businesses through Key Performance Indicators (KPI). General studies on logistics are mainly carried out from a micro perspective, explaining issues related to logistics of businesses, such as logistics activities of enterprises, single-stage operational techniques or stages of logistics, enterprise logistics when penetrating foreign markets, measuring, calculating costs and logistics efficiency. Approaching logistics from a macro perspective, there are typical projects: World Bank (2010, 2015, 2017); Kampan (2017); the Asian Development Bank study *Development Study on the North - South Economic Corridor*; Arvis et al. (2018). These studies all agree that logistics plays an important role in increasing competitiveness (Mangla, Govindan & Luthra, 2016; Montoya-Torres, Muñoz-Villamizar & Vega-Mejía, 2016) and adding value to the supply chain or reducing costs (Liu et al., 2018). Earlier, Havenga (2018) described logistics as a 'dark continent' with a lot of value that businesses have not yet exploited. Blanco and Sheffi (2017) outline the role of logistics in ensuring the availability of material requirements: raw materials, inventory, semi-finished products, finished goods. products in the production cycle to satisfy customers with the lowest costs, so logistics also creates large production capacity and commercial growth (Nguyen & Nguyen, 2019).

In addition to general logistics studies, in-depth logistics studies have been carried out in a country-specific context. On the logistics of Singapore, see Jahn, Kersten and Ringle (2018). Based on a SWOT analysis of the status of Singapore logistics and the case study of London, this research provides basic strategies and recommendations to enhance Singapore's competitiveness as a global logistics centre. Bichou (2017) reviews some of the achievements of Singapore's logistics system and, through SWOT analysis, suggests a strategy to build a global logistics integration centre. Liao and Wang (2018) analysed the role of the Singapore Government in creating an information society. Zhang and colleagues (2017) conducted an overview of the use of information technology in transportation logistics services, confirming

that the application of information technology has an increase in usefulness (PU) and convenience (Peou). The study also pointed out the advantages and disadvantages of applications of information technology, and explores the development trends of information technology in order to present recommendations for research and development of information technology in the transport logistics of Singapore (Jeevan et al., 2018).

## **Literature**

### ***Development Stages of Logistics***

In the field of economics and business, logistics also undergoes a development process consisting of many different stages, each of which has the progress, change and addition of both the internal and external features of this concept. According to the Economic and Social Commission for Asia and the Pacific (ESCAP), the field of logistics has developed in three phases: physical distribution, logistics systems and logistics management. In addition, the logistics development process can also be divided into five stages: workplace logistics, workplace logistics, corporate logistics, supply chain logistics and global logistics (Zhang, Li & Phuong, 2019).

There is also a way of dividing the development process of logistics in relation to the various industrial revolutions. Accordingly, logistics goes through the following stages. Logistics 1.0 (from the end of the nineteenth century to the beginning of the twentieth century) is the period of transport mechanisation (steam engines and ships were used as the main means of transportation instead of humans and animals). Logistics 2.0 (from the early twentieth century to 1960) involved the invention of electricity and mass production in production, leading to the automation of goods transport (thus logistics at this stage were also automated, such as automatic warehouses and automated sorting systems, automatic loading and unloading systems) (Jahn et al., 2018). Logistics 3.0 (from 1960 to 2000) was the period of systematising logistics management; it originated from the invention of computers and information technology (IT). By using IT systems – such as Warehouse Management System (WMS) and the Transport Management System (TMS) – in logistics, the automation and efficiency of logistics management, inventory and transportation were developed and significantly improved. Logistics 4.0 (2000 to present) is the latest development stage, mainly based on the development of the Internet of Things (IoT) and Big Data (the main purpose of logistics 4.0 is to save labour and standardise the labor force in supply chain management (Kesheng Wang, 2016). Technologies such as warehouse robots and autopilot are replacing processes that do not require operation and decision-making by human labour. The goal is a perfect balance between automation and mechanisation (Jahn et al., 2018).

## **Factors Affecting Logistics Operations**

### ***Freight Forwarding***

Logistics is a combination of many factors, but logistics is always the most important stage in the logistics chain. The process of transporting goods and passengers through space and over time has created transport products. Freight forwarding usually accounts for more than a third of total logistics costs. Almost all businesses want to deliver products to consumers at the right time, in the right location and for the lowest cost (Li et al., 2018). In this way, they can reduce inventories, improve production efficiency and significantly reduce logistics costs. In addition, the trend of specialisation in the stages of supply, production and distribution has made the demand for, as well as the importance of, transport factors increasingly valued (Hoang & Pham, 2018). Forwarding and transportation will now take over the transfer of raw materials into the enterprise, then distribute the products from the business to the market, forming a cycle in the production and business activities of the business (Luthra & Mangla, 2018).

### ***Marketing***

Marketing has an important role in business activities. Marketing helps businesses to survive and thrive in the market because it has the ability to adapt to changes in the market and the external environment. Marketing connects the production activities of the business with the market at all stages of the reproduction process. Marketing is also known as a basic element of logistics (Witkowski, 2017). The focus and goal of every process in the chain of logistics activities is customer-oriented, involving the desire to serve customers in the best way, to fully meet their needs. Businesses are also gradually changing their business concepts. A new motto – ‘sell customers what they need’ – has emerged in modern businesses. Such a market strategy has created many challenges as well as bringing unprecedented opportunities for many businesses. The role of marketing in the logistics chain is becoming increasingly clear (Sudan, Clark & Henry, 2015).

### ***Distribution***

If businesses want products to reach consumers, it is impossible not to mention the role of distribution factors in the logistics chain. Distribution refers to the movement of the goods of a business. Any stage of the entire process of supply, production and distribution requires the involvement of logistics for those activities to take place smoothly and effectively (da Silva, Kovaleski & Pagani, 2018). Therefore, there is a definite need for a distribution channel in the logistics system, to enable businesses to minimise unnecessary costs. In the past, people cared too much about the role of an ideal location that benefited the logistics system. Now, the location and distribution channel in the logistics system need more comprehensive innovation to optimise the flow of goods. Distribution factors in logistics will assume this role, helping

businesses to effectively combine location with time. This will result in a smooth flow of raw materials and goods through distribution channels to reach consumers (Nguyen, 2019).

### *Administration*

Logistics activities without checking and supervision factors will not achieve the set goals. Logistics management issues are expressed through the activities of logistics managers. Logistics managers must be knowledgeable about types of transportation, freight charges, the situation of warehousing, warehousing issues, the situation of supply and production of products put into circulation, distribution, distribution and marketing (Nguyen & Nguyen, 2018). Logistics managers must also be knowledgeable about the relationship between all the functions of logistics, and at the same time must coordinate and harmonise logistics operations with other actions in the business, as well as with businesses and customers. More importantly, logistics managers must think about the entire business system of the business, from receiving raw materials from the supplier until the product is delivered to the customer, including after-sales service. That thinking must include competitors and potential markets. In short, logistics managers must have big minds (Phuong, 2018).

### *Other Factors*

In addition to the four basic factors analysed above, logistics includes a number of equally important factors, such as warehousing and factory factors; spare parts replacement and repair; technical documentation; testing and supporting equipment; and human resources and human resource training.

#### *Warehouse and factory*

The warehouse and related activities represent an important element of logistics, as they are the basic connection in the logistics channel. The need for warehouses and workshops originates from the requirement to store raw materials for production and finished products before being distributed.

#### *Spare parts and repairs*

This includes spare parts or repairs for machinery and equipment used in the production process, or where the product is damaged. Spare parts for repairs, with the help of warehousing are an important element of logistics support. Replacement parts and repair parts are often used to support product distribution as after-sales service. They also play an important role in supporting the equipment of the business in the manufacturing process.

### *Technical documentation*

Technical documentation is essential for effective product support. It provides the necessary information for installation and operation. Other documents provide information on maintenance, a list of removable and replacement parts, and how to use assistive and test equipment. Technical documentation must be compatible (linked to other logistics elements) and needs to be compared to actual products to ensure the accuracy and completeness of the documentation.

### *Testing and support equipment*

Machinery, equipment and products distributed by enterprises all require regular repair, maintenance and modification. This activity requires the use of testing aids, and testing equipment is in need of additional logistics support in the form of decisions about what is needed, how much is needed and when it is needed.

### *Human resources and human resource training*

Human resource training is considered to be the biggest factor in logistics demand. Enterprises producing complex products, high technology and science content and so on require a well-trained labour force, and sufficient professional knowledge and skills. The training program must be developed in accordance with the products manufactured, and with technical documents applied to the manufacture, maintenance and repair of testing aids. Training requirements must be sufficient, ensuring quality at the right place and the right time. The effective recruiting and training designed and linked with the overall logistics activities to serve the business goals will help to minimise the costs of this logistics element.

### ***Industrial Revolution 4.0 and Logistics***

The Industrial Revolution 4.0, with its breakthroughs in the field of artificial intelligence, integrating artificial intelligence with the Internet of Things (IoT) and modernisation tools, is beginning to change the perspective of warehousing and distribution services around the world, with an estimated 5.5 million new devices connected every day. For logistics, this revolution will increasingly expand the connection of non-traditional devices such as pallets and cranes, and even trailers and cargo trailers, with the internet (Chen et al., 2017).

There is a growing trend towards using devices with new technologies such as robots to help save energy, Automated Guided Vehicles (AGV), smart forklifts, tracking, navigation, navigation and observation devices, online barcode scanning applications in warehouse management, inventory optimisation based on cloud computing, application of daily labour

control in logistics, integration of service contracts, order management and customer relations in direct logistics. The web-based traffic management system with mobile applications using Cerasis Rater will be increasingly widely used, replacing the old and outdated technologies that exist. In transport, transport vehicles are IoT in logistics 4.0. The target is IoT self-propelled vehicles. Efforts are being made to develop in this direction now that we have drones and self-propelled cars. IoT self-propelled transport vehicles will likely appear in the near future, including trucks, trains and self-propelled ships. Those are the IoT of logistics 4.0 (Bakker et al., 2017).

A smart warehouse must have IoT equipment, including IoT stacking shelves, an IoT inspection and monitoring system including ventilation equipment, cooling to ensure the requirements of goods storage, security monitoring, and fire and explosion prevention. Machinery and equipment are also automated and connected to the network. Clearly, IoT plays a key role in these intelligent facilities. With these IoTs, a virtual (cyber) logistics system can be built on the network, which can be controlled or operated by human supervision. An additional issue that needs to be discussed is that the Industrial Revolution 4.0 leads to the transfer of intelligence, automation and automated decisions to equipment (IoT), to components of the supply chain and logistics 4.0. Artificial intelligence (AI) plays an important role in this process (Mehmann & Teuteberg, 2016).

In logistics 4.0, intelligent SCM people still play a central role. First of all, the planning does not have any machinery that can completely replace human intelligence. Social relationships such as marketing, sales and so on exist between people; machinery and equipment can only help. These planning jobs still have to be human. Therefore, it can be said that automatic and semi-automatic decision-making and people are the key to logistics and SCM in the smart 4.0 era. Logistics is a form of object management that moves goods and accompanying information to reduce shipping costs, ensure fast transit time and guarantee the quality of goods. This is considered a commercial service (Quandt et al., 2017).

The application of advanced science and technology in logistics with many programs and technical tools will help to increase the service quality of commercial services. Specifically, GPS technology can help managers to determine the location of freight. Warehouse management technology Radio Frequency Identification (RFID) helps to identify goods using radio waves in real time. Application of RFID technology in warehouse management is the affixing of RFID tags on products, containers and inventory (Zan et al., 2018).

The identification number (ID) of the RFID tag is affixed to the software to synchronise it with a certain amount of data related to that product. Through a fixed or mobile RFID card reader, the manager can easily collect the IDs of the RFID tags. From there the software will analyse this ID to query back to goods data. RFID is the term used to describe a system that identifies

objects (objects and people) by radio waves. According to Hiratsuka (2006), auto-ID technology has long been used to minimise manual data entry time and effort and improve the accuracy of the data. The development of RFID dates back to the early 1920s when the radar system was born; it was then widely used to detect enemy aircraft during World War II. However, it is only since 2000 that applications of RFID in business and commerce have really attracted the attention of businesses and academia (Büyüközkan & Göçer, 2018).

### **Logistics Development Orientation in Vietnam**

Globalisation makes trade between countries and regions around the world flourish and will naturally lead to new demands for transportation, warehousing and ancillary services. New trends will lead to the inevitable development of global logistics. Vietnam's logistics is gradually being formed and integrated into the new development of global logistics, but the achievements are still very limited. In order to make Vietnam's economy truly stand up and escape the storm of the world economic crisis, it is necessary to have a clearer direction for the development of logistics activities (Chen, Tabssum & Nguyen, 2019). The development orientation of Vietnam's shipping industry is clearly stated in the Prime Minister's Decision No. 1601/QD-TTg of 15 October 2009, on Vietnam's maritime development planning up to 2020 and orientations to 2030 (Banomyong, Huong & Ha, 2017).

### ***Shipping***

Vietnam's logistics still faces many difficulties and weaknesses, including the port system. Vietnam needs to improve the quality of its shipping services, meet the needs of domestic shipping, improve its market share of transporting import and export goods, and hire foreign cargo ships for distant sea transport routes. According to Decision 160/QD-TTg of the Prime Minister in 2020, the orientation to 2030 will focus on developing the system of seaports and port access channels in a synchronous and modern way. The investment in and construction of seaports should be accelerated, with key investment in locations where conditions and demands for the construction of seaports are in place, in order to exploit natural advantages and take full advantage of sea transport capabilities. At the same time, it serves as a basis for building and developing Vietnam's seaport system in accordance with a comprehensive and unified master plan on a national scale, creating centres for connecting transport infrastructure areas, especially in key economic regions, establishing economic zones and large industrial parks, and building large international transit ports and international gateway ports in appropriate areas to affirm the positions and advantages of the marine economy, to create important economic exchanges between domestic and foreign countries in order to realise the objectives of the maritime strategy. The shipbuilding industry is also quite clearly oriented by the government. By 2020, Vietnam's shipbuilding industry development will reach a regional advanced level to build new tonnage ships of up to 300,000 DWT, passenger ships, oil service



ships, rescue and rescue ships and maritime assurance works. This will meet 65 to 70 per cent of the need for additional domestic fleets; enable the repair of covers, machines, electricity and electronics for ships of up to 400,000 DWT; meet socio-economic development needs; and increase export to foreign countries, contributing to an influx of foreign currency (Zhang et al., 2019). The aim is to balance the shipbuilding and repair industry, adopt modern technology and focus on in-depth investment to promote the effectiveness of existing shipbuilding and repair facilities, including auxiliary industries (Phan & Tran, 2016).

### ***Maritime Services***

Vietnam needs to develop a synchronised shipping support service, especially logistics services and high-quality multimodal transport services. It also needs to expand abroad to integrate with the rest of the world, and to form inland ports suitable for the development of economic corridors and distribution centres associated with seaports. In addition, Vietnam also needs to synchronously develop logistics facilities, maritime security, search and rescue and a maritime information technology system to meet development requirements and align itself with the requirements of international conventions (Phuong, 2019).

### ***Human Resources for Logistics***

It is necessary to develop regular and professional long- and short-term development plans. In the long-term strategy, the government and authorities need funding, support and interest in developing and making policy-oriented policies related to logistics. In foreign trade economics universities and colleges, it is necessary to open logistics faculties and to seek domestic and international funding for short-term training programs at home and abroad. Collaboration and cooperation with FIATA, IATA and other non-governmental organisations would provide more substantial training funding.

## **Solutions to Improve Logistics Operations in Vietnam**

### ***Solutions Related to Infrastructure***

Infrastructure and technical facilities are prerequisites for logistics service development. In Vietnam, transportation and warehousing activities are the two most popular and developed logistics activities. However, Vietnam's infrastructure for logistics is still limited, which is not commensurate with a country that has so much logistics potential. Therefore, infrastructure plays a particularly important role and attention needs to be paid to more rational and comprehensive development (Nguyen, 2019).

### ***Building and Modernising Transport Infrastructure, Particularly Wharves and Yards***

Transport infrastructure is always considered the lifeblood of logistics activities. Without synchronous and advanced facilities, it is difficult to bring efficiency to logistics activities. In addition, the development of a transport system will facilitate the development of multimodal transport. However, the infrastructure in Vietnam is still underdeveloped, as is the trend of global logistics. This will be a huge obstacle for the growth and development of logistics activities when Vietnam's economy has been integrating with the global economy. A modern and synchronous transportation infrastructure includes a system of river, road, sea and rail, with a network of seaports, railway stations, airports, warehouses and yards as well as equipment for loading and unloading goods and containers at the delivery points. In short, it must be a harmonious connection between transport by road, air, rail and sea (Phuong & Pham, 2019).

#### *Infrastructure of Sea Transport*

Sea transport accounts for a large proportion in transport and delivery of Vietnam's import and export goods, accounting for 90 per cent of the value of goods. Moreover, Vietnam is a country with a very favourable geographical position for the development of the maritime industry. In terms of investment on maritime infrastructure, including seaport systems and beaches, logistics activities in Vietnam have the potential for further development. With regard to building and further improving the seaport system, Vietnam has many port systems but their development is still not sufficient to meet the needs of the current maritime industry. The scale of Vietnam's ports is still limited, not really enough for the development of logistics activities in accordance with the stated orientation. Sea transport is considered one of the basic activities of logistics, while the seaport is the foundation for the development of shipping. Therefore, the importance of developing and expanding a seaport system in Vietnam is extremely important. It is therefore necessary to focus on building and developing the seaport system, including wharves, warehouses and inland clearance ports (ICDs), attaching importance to investment in a regional deepwater port in the region. These ports are the direct connection point between Vietnam, Europe and the United States, so it is important to be able to accommodate large vessels. Vietnam needs to conduct extensive river dredging, ensuring a minimum depth of 14 metres. According to many experts, Vietnam needs to focus on investing in a few major seaports rather than a small investment in small ports. Seaports have great strategic positions in Vietnam – for example, Hai Phong port and Ho Chi Minh City port. The construction of a seaport system must comply with the port development plans approved by the government, avoiding scattered investment in a 'ask-give' style that does not bring economic efficiency.



### *Infrastructure of Inland Waterway Transport*

Inland waterway transport is considered a potential area that need to be developed in Vietnam. To build a solid river infrastructure, meeting the needs of transporting goods for logistics activities, there must be many solutions to enhance the quality of operation of different types of transportation on river routes and inland waterways. Vietnam needs more policies to encourage investment from businesses (SOEs and private enterprises) to gradually improve the essential infrastructure for this type of transportation. Moreover, the inland waterway transport fleet, while taking advantage of foreign development assistance capital, needs to pay attention to the development of multimodal transport suitable to transport on inland waterways. It could then take advantage of Vietnam's dense rivers and canals to build suitable wharves and river transport routes, and connect with sea, railway and motor vehicle routes. In this way, multimodal transport in Vietnam will enable improved service quality.

### *Railway Infrastructure*

A major obstacle in the development of rail transport in Vietnam today is the monopoly issue, which makes the railway transport industry uncompetitive and unsuitable in the market economy. Vietnam needs a new policy to eliminate this monopoly so that the railway industry will develop more equitably and dynamically to meet the transport needs of logistics activities. Currently, there is no business enterprise in the field of logistics that has services related to rail transport. In addition, Vietnam also needs to pay attention to the construction, renovation, upgrading and expansion of railway lines, especially the North–South Line. In recent years, rail has not fully met the demand for freight transportation at home and abroad. Renovating and upgrading railway lines, as well as retooling machinery and equipment for transportation, is an urgent and necessary requirement in the railway industry.

### *Airway Infrastructure*

In recent years, the issues of cost savings and transit time have been major motivators for the expansion of air transport. Many low-cost airlines have been established to meet the market demand. But future demand will expand further. The aviation industry in Vietnam wants to develop, but the most significant problem it faces is the need for capital to buy cargo planes, together with establishing the means of loading, unloading and transporting. It is also necessary to expand domestic and foreign routes to places with freight demand.

### *Road Infrastructure*

Road transport is always a major activity, playing a very important role in the logistics chain. The problems that causes many obstacles for the transport of goods by road in Vietnam are

safety and traffic congestion. Over the past few years, Vietnam has made efforts to mitigate this situation but there are still many unresolved problems, especially on critical roads and in large urban areas. Traffic congestion causes many difficulties for cargo transportation, reducing the productivity of many logistics activities. This is a difficult task to solve, but not an impossible one. It is necessary to upgrade and repair the seriously degraded roads while constructing new roads to reduce traffic congestion. In particular, Vietnam needs to invest more effectively in building key bridges. The situation of investing in construction of bridges and road tunnels in a sluggish way has created many difficulties and inconveniences in the process of transporting goods. Therefore, once invested in construction, there is a need to proceed quickly, raise sufficient capital, and avoid shortages of capital that will lead to construction being abandoned. In addition, Vietnam must also build road infrastructure that is suitable for the transportation of containers.

### ***Building Information Technology Infrastructure for Logistics Activities***

The state needs establish a national electronic data-technology exchange system between the government and enterprises, and between business enterprises. Standardising e-commerce and customs clearance processes is necessary. It is vital to reduce cumbersome procedures, paperwork and time in customs clearance, as well as in the issuing of documents in the import–export process after conducting electronic procedures. To develop an online system, the state needs to play a role in the research and application of new technologies. It is necessary to invest in training IT professionals to manage the national IT infrastructure, creating favourable conditions for the operation of enterprises. It is also necessary to invest in the application of globally recognised advanced electronic software. There is a need for a new section of experts to study new e-commerce program products in other countries around the world and the region. Programs can then be created that are suitable for Vietnam’s IT infrastructure, as well as bringing efficiency to the business processes of IT enterprises.

### ***Solutions to Develop the Shipbuilding Industry and Improve the Vietnamese Fleet***

Investing in shipbuilding and ship repair industries is of great importance for logistics activities. The shipbuilding industry not only needs a huge amount of investment capital but also requires a significant amount of capital to build ships with deferred payments from ship owners. Therefore, the search and mobilisation of capital sources for the shipbuilding industry must come from many different sources, particularly venture capital from foreign countries. The current transport market desperately needs large container ships, as this is still a weakness of Vietnam’s shipbuilding industry. In recent years, the volume of containerised cargo has reached a high level, as containerisation dominates international transport. It is necessary to quickly develop the national container fleet, a task that should be a top priority in the coming years. The issue of fleet quality in Vietnam is still limited. To overcome this, Vietnam needs



to have support policies in place in the areas of science, technology, research and application of new technologies, directly serving the construction of high-tech products to meet international quality standards, ensure safety in transporting goods by sea, and remove Vietnamese fleets from the blacklist of security inspection systems on world sea routes.

### ***Further Improve the Legal System to Regulate Logistics Activities***

The law is always an inseparable part of economic development. For logistics activities in Vietnam to develop, they need the support of policies and laws. The basis of Vietnam's legal corridor for the logistics industry needs to be clear, consistent and more rational. It will then be possible to create a more convenient and efficient logistics market. First, the state needs to issue more complete legal documents governing logistics activities, especially in sea transport and forwarding. Lawmakers should also be interested in clearly explaining such issues as logistics concepts, logistics service dealers, logistics service contracts and liability limits to become a guideline for all participants in logistics activities. Moreover, it is necessary to revise the old legal documents to suit the globalisation of the international economy.

### ***Solutions to Improve the Quality of Human Resources***

Human resources are the subjective factor that dominates the operation of all industries. The physical and infrastructure conditions may be good, but without a good staff with in-depth knowledge and experience, no industry will grow as expected. To develop the quality of human resources involved in logistics activities, a long-term and durable development strategy is needed. Once logistics knowledge is taught methodically and systematically at the tertiary level, Vietnam will have a team of skilled professionals with enough knowledge and the ability to effectively participate in the logistics chain process. Those who have already been involved in the industry also need to be further trained in professional knowledge and professional skills. Many short-term courses in logistics, including theoretical knowledge and practical experience taught by leading experts, have attracted the attention, attention and acceptance of those in the profession. At the same time, coordination between the authorities with major industry forums such as Vietship or the maritime forum and logistics forum is necessary to set a new direction for developing resources for the logistics industry. There is a need to focus on developing more formal and professional human resources. Vietnam also needs to seek more domestic and international funding for short-term training programs, both at home and abroad, as well as to coordinate and take advantage of cooperation with FIATA, IATA and other non-governmental organisations to receive more regular training funding.

## Conclusion

In order for the Vietnamese economy to truly develop in line with the inherent potential of a young and dynamic country, Vietnam needs to pay more attention to boosting the efficiency of the logistics industry. Logistics activities in Vietnam are influenced by many different factors, both subjective and objective. The development of this service industry therefore needs the support of nearly all sectors of the economy. Through the development process, logistics in Vietnam still have many weaknesses and limitations, primarily because Vietnam does not know how to solve and thoroughly improve the difficulties faced by the industry. For each factor, Vietnam needs different perspectives and solutions for the development of its logistics market in accordance with domestic conditions, and to catch up with global logistics trends. From objective factors about the world economy, Vietnam's economy, infrastructure, legal corridors and climate change issues to subjective factors such as human resources, corporate awareness, industry authorities and international trade practices, Vietnam needs have a clearer focus on the direction of each of these factors.

The current most important issue in Vietnam's logistics industry is probably infrastructure and human resources. These factors are considered to have the most influence on all activities in the logistics chain, not only in Vietnam but all over the world. Vietnam needs to concentrate a lot of resources to improve the quality of these two factors, ensuring that its logistics experience the fundamental conditions necessary to overcome the current weakness.

The global economy faces many fluctuations and potential risks. This is a big challenge for the logistics industry, which is still young and inexperienced in Vietnam, but the potential to turn difficulties and challenges into advantages and opportunities to expand development is enormous in Vietnam. This requires a combination of internal and external resources of all logistics-related factors. Clearly oriented and timely solutions with high feasibility, consistent with global development trends, will surely create a new future for Vietnam's logistics industry.

Logistics 4.0 offers many opportunities for the development of new technologies and for business benefits. The main challenges of developing logistics 4.0 are the need for a transparent, reclassified, flexible and intelligent logistics system. The current requirement for Vietnam is to have a clear roadmap for the development of the logistics industry in a global context. That will require determination from the government, as well as transparency in the management of transport infrastructure and IT. Finally, to ensure high-quality human resources, close links between the government, training institutions and logistics enterprises are needed.

## REFERENCES

- ADB (2013) *Development Study of GMS Economic Corridors (formerly Greater Mekong Subregion: Development Study of the North South Economic Corridor)*. Asian Development Bank.
- Adewole, A., & Struthers, J. J. (2018). *Logistics and Global Value Chains in Africa: The Impact on Trade and Development*. Springer.
- Arvis, J.-F., Ojala, L., Wiederer, C., Shepherd, B., Raj, A., Dairabayeva, K., & Kiiski, T. (2018). *Connecting to compete 2018: trade logistics in the global economy*. World Bank.
- Bakker, S., Dematera Contreras, K., Kappiantari, M., Tuan, N., Guillen, M., Gunthawong, G., ... Van Maarseveen, M. (2017). Low-carbon transport policy in four ASEAN countries: Developments in Indonesia, the Philippines, Thailand and Vietnam. *Sustainability*, 9(7), 1217.
- Banomyong, R., Huong, T. T. T., & Ha, P. T. (2017). A Study of logistics performance of manufacturing and import-export firms in Vietnam. *Tạp Chí Kinh Tế Đối Ngoại*, 94(94).
- Bichou, K. (2017). Port Logistics and Hinterland Development. *Encyclopedia of Maritime and Offshore Engineering*, 1–11.
- Blanco, E. E., & Sheffi, Y. (2017). Green logistics. In *Sustainable Supply Chains* (pp. 147–187). Springer.
- Büyükoçkan, G., & Göçer, F. (2018). Digital supply chain: literature review and a proposed framework for future research. *Computers in Industry*, 97, 157–177.
- Chen, C., Tabssum, N., & Nguyen, H. P. (2019). Study on Ancient Chu Town Urban Green Space Evolution and Ecological and Environmental Benefits. *Nature Environment and Pollution Technology*, 18(5), 1733–1738.
- Chen, S., Shi, R., Ren, Z., Yan, J., Shi, Y., & Zhang, J. (2017). A blockchain-based supply chain quality management framework. In *2017 IEEE 14th International Conference on e-Business Engineering (ICEBE)* (pp. 172–176). IEEE.
- da Silva, V. L., Kovaleski, J. L., & Pagani, R. N. (2018). Technology transfer in the supply chain oriented to industry 4.0: a literature review. *Technology Analysis & Strategic Management*, 1–17.
- Havenga, J. H. (2018). Logistics and the future: The rise of macrologistics. *Journal of Transport and Supply Chain Management*, 12(1), 1–10.
- Hiratsuka, D. (2006). Outward FDI from and Intraregional FDI in ASEAN: Trends and Drivers.
- Hoang, A. T., & Pham, V. V. (2018). A review on fuels used for marine diesel engines. *Journal*

*of Mechanical Engineering Research & Developments, 41(4), 22–32.*

- Islam, D. M. Z., Fabian Meier, J., Aditjandra, P. T., Zunder, T. H., & Pace, G. (2013). Logistics and supply chain management. *Research in Transportation Economics*. <https://doi.org/10.1016/j.retrec.2012.10.006>
- Jahn, C., Kersten, W., & Ringle, C. M. (2018). Logistics 4.0 and sustainable supply chain management: innovative solutions for logistics and sustainable supply chain management in the context of industry 4.0. In *Hamburg International Conference of Logistics (HICL) 2018*. epubli.
- Jeevan, J., M.R, O., A.H, S., G.K, P., & T.M.H, D. (2018). An Evolution of a Nexus between Malaysian Seaport Centric Logistic and An Evolution of a Nexus between Malaysian Seaport Centric Logistic and. *International Journal of E-Navigation of Maritime Economy, 10*(April 2019), 01–015.
- Kampan, P. (2017). Strategic development of ASEAN logistics infrastructure. *The Open Transportation Journal, 11*(1).
- Li, Y., Kannan, D., Garg, K., Gupta, S., Gandhi, K., & Jha, P. C. (2018). Business orientation policy and process analysis evaluation for establishing third party providers of reverse logistics services. *Journal of Cleaner Production, 182*, 1033–1047.
- Liao, D. Y., & Wang, X. (2018). Applications of blockchain technology to logistics management in integrated casinos and entertainment. *Informatics*. <https://doi.org/10.3390/informatics5040044>
- Liu, J., Yuan, C., Hafeez, M., & Yuan, Q. (2018). The relationship between environment and logistics performance: evidence from Asian countries. *Journal of Cleaner Production, 204*, 282–291.
- Luthra, S., & Mangla, S. K. (2018). Evaluating challenges to Industry 4.0 initiatives for supply chain sustainability in emerging economies. *Process Safety and Environmental Protection, 117*, 168–179.
- Mangla, S. K., Govindan, K., & Luthra, S. (2016). Critical success factors for reverse logistics in Indian industries: a structural model. *Journal of Cleaner Production, 129*, 608–621.
- Mehmann, J., & Teuteberg, F. (2016). Process reengineering by using the 4PL approach: A case study on transportation processing in the agricultural bulk logistics sector. *Business Process Management Journal, 22*(4), 879–902.
- Montoya-Torres, J. R., Muñoz-Villamizar, A., & Vega-Mejía, C. A. (2016). On the impact of collaborative strategies for goods delivery in city logistics. *Production Planning & Control, 27*(6), 443–455.
- Nguyen, H. P. (2019). Blockchain - an indispensable development trend of logistics industry in Vietnam : Current situation and recommended solutions. *International Journal of E-*



*Navigation of Maritime Economy*, 13, 14–22.

- Nguyen, X. P. (2019). The bus transportation issue and people satisfaction with public transport in Ho Chi Minh city. *Journal of Mechanical Engineering Research and Developments*. <https://doi.org/10.26480/jmerd.01.2019.10.16>
- Nguyen, X. P., & Nguyen, P. Q. P. (2018). Strategies for Maritime Development: A case in Vietnam. *European Journal of Engineering Research and Science*, 3(12), 14–19.
- Nguyen, X. P., & Pham Nguyen, D. K. (2019). Experimental Research on the Impact of Anchor-Cable Tensions in Mooring Ship at Vung Tau Anchorage Area. *International Journal on Advanced Science, Engineering and Information Technology*, 9(6), 1892–1899.
- Phan, D., & Tran, N. T. (2016). The assessment of factors affecting logistics service competencies of enterprises in Dong Nai province. *European Journal of Business and Social Sciences*, 5(4), 62–73.
- Phuong, N. H. (2018). Developing tourism in the Mekong Delta in the context of globalization and international integration. *Monographs and Publications at the Printing House of Ho Chi Minh City University of Economics*, 131–136.
- Phuong, N. H. (2019). What solutions should be applied to improve the efficiency in the management for port system in Ho Chi Minh City? *International Journal of Innovation, Creativity and Change*, 5(2), 1747–1769.
- Phuong, X., & Pham, V. T. (2019). The orientation for the development strategy of seaport system in Ho Chi Minh city by key measures to enhance the efficiency of port system management. *International Journal of E-Navigation of Maritime Economy*, 11, 24–32.
- Quandt, M., Beinke, T., Ait-Alla, A., & Freitag, M. (2017). Simulation Based Investigation of the Impact of Information Sharing on the Offshore Wind Farm Installation Process. *International Journal of E-Navigation of Maritime Economy*, 7, 042–054. <https://doi.org/10.1155/2017/8301316>
- Sudan, R., Clark, P., & Henry, B. (2015). Cost and logistics for implementing the American College of Surgeons objective structured clinical examination. *American Journal of Surgery*. <https://doi.org/10.1016/j.amjsurg.2014.10.001>
- Tongzon, J. L., & Lee, S.-Y. (2016). Achieving an ASEAN single shipping market: shipping and logistics firms' perspective. *Maritime Policy & Management*, 43(4), 407–419.
- Witkowski, K. (2017). Internet of things, big data, industry 4.0–innovative solutions in logistics and supply chains management. *Procedia Engineering*, 182, 763–769.
- Zan, Y., Zhu, H., Song, L., & Yuan, L. (2018). Development of a Virtual Teaching Platform for Remotely Operated Vehicles. *International Journal of E-Navigation of Maritime Economy*, 10, 14–21.



- Zhang, L., Li, C., & Phuong, N. H. (2019). Economic Development of Biomass Energy Industry in Heilongjiang Province Based on Analytic Hierarchy Process. *Nature Environment and Pollution Technology*, 18(5), 1487–1493.
- Zhang, M., Pratap, S., Huang, G. Q., & Zhao, Z. (2017). Optimal collaborative transportation service trading in B2B e-commerce logistics. *International Journal of Production Research*, 55(18), 5485–5501.