

Opportunities, Challenges And Solutions For Logistics 4.0 Development In Vietnam

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Abstract: Logistics 4.0 is synonymous with the Fourth Industrial Revolution. The term refers to the digitization of the industrial sector, which leads to the digitization of physical elements and how they function. This simply shows that products, plants, goods, machines, warehouses, vehicles, etc. are all interconnected and do not operate autonomously. In the face of the strong development trend of science and technology and the Industrial Revolution 4.0, besides the great opportunities brought, Vietnam's logistics industry will have to face many difficulties and challenges, requiring agencies and agencies. Management, associations, and logistics enterprises must understand this well to have solutions to adjust to the new situation. The article focuses on introducing the constitutive elements of Logistics 4.0, opportunities and challenges, and proposes recommendations for stakeholders.

Keywords: Logistics in the 4.0 period, logistics, distribution intermediaries,...

Date of Submission: 20-05-2022

Date of Acceptance: 03-06-2022

I. INTRODUCTION

Thanks to the industrial revolution 4.0, companies and businesses can take advantage of opportunities to shorten order fulfillment times and bring satisfaction to customers. When an enterprise provides logistics services, they must ensure all the necessary stages are in place to deliver packages to customers, including the service of bringing goods to centralized warehouses or individual warehouses. At the same time, in the context of the Industrial Internet of Things (IoT), logistics challenges can entail a number of things such as: a high need for transparency (supply chain visibility); integrity control (right product, right time, place, quantity, condition and at the right cost) of the supply chain [1]; activate the 'reconfiguration' of the supply network, in particular by reviewing service level agreements with contracted and service providers; supply network design, towards achieving a lean, agile, flexible and green supply chain [2]. In this context, logistics will be addressed under the term "Logistics 4.0". From the perspective of technology and internal processes, it should be noted that the goal of Logistics 4.0 is not to replace people in their work, but to avoid inaccuracies and have a faster process where information can be shared easily and in real time. There will always be a need for those who control the processes and control any system failures. Facing this situation, it is important to understand the opportunities and challenges in this industry in the current period when Vietnam needs a clear direction to restore and develop the logistics system after the pandemic COVID. From this fact, the article focuses on introducing the contents of the core elements constituting logistics 4.0 and, at the same time, introducing the opportunities and challenges that businesses are facing today. number of recommendations for stakeholders.

II. THE THEORY OF LOGISTICS 4.0

2.1. Concept of Logistics 4.0

Logistics 4.0 is the latest development phase of logistics, mainly based on the development of the Internet of Things (IoT) and Big Data. The main purpose of Logistics 4.0 is to save labor and standardize the workforce in supply chain management (Kesheng Wang, 2016). Technologies like warehouse robots and autonomous driving are trying to replace processes that don't require human labor. The aim is to achieve the perfect balance between automation and mechanization. (Laura Domingo, 2016)

2.2. Components of logistics 4.0

Visibility. The field of logistics is driven by advanced technology that can lead to increased visibility and transparency from digitalization throughout the supply chain management. Visibility will incentivize businesses to build an intelligent system. It will also prove to be an important prerequisite, which will make the internal logistics work, transparent, widespread, and much more efficient than it was at the beginning. Various smart ports around the globe, especially those located in the Middle East, have started to implement advanced solutions that allow real-time access to tracking shipments and document viewing, along with important information for freight carriers and customers.

Smart devices. Traditional logistics components have been rapidly replaced by "smarter" versions in recent times, which has largely changed the way shipments are moved from supplier to user. their end. The introduction of technology solutions such as smart containers and smart pallets into logistics utilities has changed the traditional shipping process. In fact, some classic transporters have already begun incorporating new prospects in the field, such as MDMs for logistics, which can help them collect data as well as perform judgment-related tasks. based on the collected analytical information.

Using IoT. Since Industry 4.0 was introduced to the market, a number of IoT development organizations have committed to developing advanced digital devices that can be seamlessly deployed and embedded in warehouse facilities. Incorporating such IoT solutions into innovations is crucial to enriching business operations. The business implementation of such solutions has the potential to enhance technology solutions such as utilities and smart containers when they are connected to the cloud. IoT adoption will not only improve supply chain management, but also drive profitability by gaining insights.

Industry Integration 4.0. As mentioned, the latest technology-based logistics model runs in parallel to the Industry 4.0 model. What makes Logistics 4.0 stand out is its ability to collaborate and integrate with Industry 4.0 processes and systems. This integration will create an environment for building community relationships and synergies between all three: shippers, manufacturers, and end users. [6]

In addition, it provides more transparency than the traditional approach most companies follow.

Integrating 4.0 will bring the following benefits:

- Tight security from external threats
- Store important information and data
- Meet end-user requirements

2.3. The impact of the industrial revolution 4.0 on the development of the logistics industry

According to the survey results of the research team published in the Logistics White Paper 2018, more than 30% of IT applications currently being used in logistics enterprises are basic applications such as logistics and warehouse management systems. yards, electronic data exchange, transportation management, and customs declaration (mostly applied 75.2% to 100%)... Meanwhile, it is forecast that Industrial Revolution 4.0 will has a strong impact on the logistics service industry in general and new logistics technology in particular, thereby affecting the logistics business model of logistics service providers. [7]

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In addition, logistics companies around the world are rapidly improving technology to catch up with this trend and improve profit margins, through equipping with modern and automatic tools such as: Robots to help save energy and unskilled labor costs; Automated delivery vehicles (AGVs) can fulfill orders, replenish goods in the warehouse by themselves, Equipment for tracking, locating, navigating, and observing by devices using WiFi and Bluetooth; Co-pilot application on Android mobile phones used in international logistics activities; The application provides routing (mapping) and direction (direction routing), facilitating navigation through online tracking of the vehicle; Online barcode scanning application in warehouse management; Cloud-based inventory optimization; Application to control daily labor in logistics (Android web fleet application); Integrating service contracts, order management, customer relations in online logistics.

Logistics services are a highly international industry that rapidly applies scientific and technological advances to activities. Currently, developed countries are gradually implementing E-Logistics, Green Logistics, E-Documents... and applying cloud computing technology, Blockchain technology, etc. In the context of Industry 4.0, has begun. Applying artificial intelligence or robots to perform a number of services, such as packing or unloading goods from containers, loading and unloading goods in warehouses, yards, etc.

Meanwhile, at present, Vietnam's logistics service providers are still at a low level in applying IT to these goods, mainly using electronic customs declaration software, vehicle locating technology, etc. email and basic internet... The main reason is that, nowadays, all enterprises are small and medium-sized, so they have limited investment capital, and human resources specialized in IT are still weak and lacking, although 96% of enterprises are qualified. A recent VLA survey found that technology is a differentiating factor that facilitates competition for businesses.

2.4. Opportunities and challenges for Logistics 4.0 in Vietnam

Opportunity. Vietnam is a country with the fastest information technology growth in the world. The logistics and e-commerce markets in the region have reached a very large scale and speed, promising great

benefits and opportunities. The digital transformation revolution in economic and social fields, specifically industries and services. Logistics 4.0 contributes to reducing delivery time, transportation costs, and communication costs, thereby optimizing business costs and meeting the increasingly different needs of customers. Digital transformation helps the LSC system of companies and enterprises in our country step by step integrate, improve governance, be more transparent and competitive.

Vietnam's logistics industry has great opportunities in the trend of Industry 4.0. The Logistics Report 2020 states that "the application of IT in the logistics field is no longer strange to enterprises, this is an extremely important factor determining the competitiveness of enterprises." The concept of logistics in the fourth industry, also known as "Logistics 4.0", has gradually been shaped more clearly for the logistics industry" (VLR, 2020). Some suggestions are as follows:[1] Domestic logistics enterprises need to invest heavily in IT. The level of IT application in management needs to be raised to a new level; (2) Despite the high investment cost, with supportive policies from the government, businesses need to synchronously improve and gradually automate resource management systems (ERP), warehouse (WMS), logistics, and logistics. load (TMS) and other systems; (3) Proactively develop IT systems in Logitics to gradually replace Logistics platforms and applications exploited by foreign companies (4) Proactively overcome human resource challenges through coordination to train. Most of the logistics human resources are still weak, so the work is mainly simple labor. Managers often have to self-educate to improve their working skills, especially with new technology skills to take on tasks. According to calculations, in the next 3 years, the logistics industry needs about 18,000 more workers, production and service businesses need more than one million skilled logistics workers. [11]

Challenge. Logistics 4.0 seems to be a lucrative value-added proposition for all businesses wishing to escape the complexity of global supply chains. However, reaping the full benefits of these technologies can come with a host of hurdles for many companies. The top three challenges businesses can face are covered here:

- Reduced information security and the imitation of information technology
- Change of planning according to the previous orientation
- Break the habit of using spreadsheets

For traditional logistics companies, the hardest hurdle to overcome is getting rid of spreadsheets to do business operations. To make this happen, planners will now have to let go of their existing operations and learn how to contribute to the repository of information by creating concrete plans in Excel. In addition, they will also have to resist the transparent workflow mindset to achieve success in advanced supply chain management. Besides the positive aspects, Vietnam's logistics industry also faces significant challenges in this transformation towards the 4.0 trend.

According to the 2017 Logistics Report of the Ministry of Industry and Trade, the information technology infrastructure still faces the following problems:

At the micro level (in companies and enterprises): the investment cost in information technology systems is large, so businesses cannot invest synchronously, but only change a few small systems, such as the system. warehouse management system (WMS), transport management system (TMS),... While, automation system for warehouses and distribution centers still maintains the old system.

At the macro level, although the infrastructure and level of information technology in Vietnam have developed, there are still many applications for the logistics industry that are lacking.

Another big challenge of logistics 4.0 in Vietnam is the problem of human resources.

For the staff. most of them have graduated from university but are not specialized, so to meet the job, they often have to attend courses to improve their professional qualifications and skills in the process of working.

About the labor force: most of them have low education level, the main job is loading and unloading goods, inventory counting, using more force than machinery. This is partly due to the outdated means of labor and the lack of specialized labor.

Logistics costs are still high. According to data from the Vietnam Logistics Business Association, currently 90% of operating logistics enterprises are Vietnamese enterprises, but only account for about 30% of the market share, the rest belongs to foreign enterprises. Notably, the number of enterprises is many but mainly small enterprises, with limited scale in terms of both capital and human resources as well as international operation experience. There is no link between stages in the logistics supply chain and between logistics service enterprises and import-export enterprises. Therefore, in both the buying and selling directions, domestic logistics enterprises are limited in terms of "playing field."

Not only that, the number of businesses providing integrated logistics services (3PL: providing third-party logistics services or logistics under contract) and 4PLs (providing fourth-party logistics services or distribution chain logistics) in Vietnam South is still limited. The proportion of 3PL and 4PL enterprises only accounts for 16% of the total number of enterprises in the logistics industry (Vietnam Logistics Report 2019). However, this piece of cake is mainly in the hands of foreign enterprises. Therefore, according to business

representatives, Vietnam has much higher logistics costs than other countries in the world. This creates a barrier to Vietnam's market competitiveness.

Moreover, the procedures of the concerned agencies have not yet created favorable conditions, such as the control of goods in transit through the border gates, causing difficulties for shipping lines, customers, etc. For example, the control rate high increase in goods, long inspection time, costs for customers to store containers, slow delivery of raw materials into production. Some items are in transit but are subject to the same procedures as imported and exported goods and the domestic market, such as: sub-licensing for quarantine, sub-licensing for quotas, etc., especially during the epidemic period, the handling process and procedures are still cumbersome. This fact, it also poses many challenges for Vietnamese enterprises in terms of competition, service quality, and application of information technology as well as human resources.

III. SOME PROPOSALS AND RECOMMENDATIONS TO MEET THE 4.0 LOGISTICS TREND

3.1 Attached to the Government

Currently, Vietnam's logistics service industry is still far behind the world in the application of high technology. In order to apply modern science and technology, catch up with international standards, and follow the trend of forming the logistics industry in the context of Industry 4.0, the state needs to have policies to support part of the investment capital for logistics enterprises and policies to encourage logistics enterprises. encourage high-tech enterprises to have a form of leasing so that logistics enterprises do not have to make a large initial investment in technology.

Along with that, continue to perfect the national Single Window, ASEAN Single Window with the active participation of ministries and branches, thereby creating favorable conditions for businesses in carrying out import and export procedures; building and developing e-Government towards digital government and digital economy, with the core being providing high-level online public services to citizens and businesses.

At the same time, consider assigning a focal government agency such as the Ministry of Industry and Trade, the Ministry of Transport, or the Ministry of Science and Technology, VLA to research and deploy technology platform solutions for logistics services to serve efficiency. effective for data exchange between stakeholders, including government agencies, shipping lines, logistics companies, etc., and for the process of "digitization" at a national scale. [ten]

In addition, consider policies to reserve land for logistics infrastructure development planning, avoid converting agricultural land into real estate, which would narrow the operating space of logistics infrastructure.

3.2. On the Side of Vietnam Association of Logistics Service Enterprises

Promote research and application of Industry 4.0 achievements in logistics activities. Currently, VLA is researching the application of high-tech science such as Blockchain to a number of logistics activities. In which, it is conducting research on the mass application of e-DO (Electronic Delivery Paper) for retail shipments (LCL) and participating in the eB/L project of the International Freight Forwarding Association FIATA. Typically, Saigon Newport is piloting e-Port and e-DO with a few shipping lines...

In the period of extensive economic integration, international cooperation plays an important role in the development and improvement of the competitiveness of Vietnam's logistics service industry. Through international cooperation, Vietnam can take advantage of investment capital in the logistics industry and expand the operational scale of enterprises, learn management experience, train high-quality human resources and transfer skills technology in the conditions of the Fourth Industrial Revolution. In that context, VLA's role in international connections and cooperation in the field of logistics services is very large, thereby continuing to promote the positive results and foundations that VLA has built over the years.

3.3. On the side of logistics businesses

Enterprises operating in the field of logistics need to make many breakthroughs and further promote the application of modern technology, improve governance capacity, strengthen cooperation, connect domestic, regional, and global, manage Good management of the supply chain, reduce costs, shorten the time of goods movement. Specifically, domestic logistics enterprises need to strengthen the application of modern science and technology in line with the trend of forming the logistics industry in the Fourth Industrial Revolution to improve competitiveness, improve service quality, and reduce prices and fees for logistics services. service. Soon to form more and more logistics service enterprises with high competitiveness in domestic and international markets. In a fiercely competitive environment of the service market and increasing demand for human resources in the coming Industry 4.0, Vietnam's logistics service industry needs to have high-quality human resources with both practical skills and practical skills. professional knowledge and English proficiency in logistics.

According to a survey by VLA, only human resources for logistics service providers from now to 2030 will need new and methodical training of about 250,000 employees to not only meet domestic requirements but also work employment abroad, especially in the ASEAN Economic Community.

In short, in order for the training method to meet the requirements of Industry 4.0, in addition to enhancing on-the-job training and E-learning, it is necessary to focus on the training resources of universities and vocational secondary schools. School-based training combines with practical training, bringing high-tech scientific programs on logistics into training at universities...

3.4. On the side of logistics training institutions

In the coming period, logistics human resource training institutions in Vietnam need to implement the following important solutions:

Logistics is a field with a very high degree of integration, so logistics human resources must be trained to not only meet the requirements of domestic enterprises but also work in the international environment, especially in the community. Asean Economy. Therefore, logistics human resource training institutions in Vietnam need to innovate training programs and content according to the standards of international training programs (such as FIATA training program, AFFTA-ASEAN program, etc.), Vocational training program Au4Skills Australia - Vietnam). In these programs, it is necessary to combine training in professional knowledge with professional skills; English language training for logistics with computer skills required by the 4.0 technology revolution. Develop appropriate training programs for each target group of learners, including learners who are officials in state management agencies, local departments, and agencies involved in policy making and direct management. in the field of logistics in the area; officers in charge of work at the office and officers working in the field; corporate management staff. At the same time, develop logistics training programs for different industries (leather, footwear, textiles, electronics...).

Increasing the number of well-trained lecturers in the right industry/specialization in logistics; creating conditions for lecturers to supplement knowledge and practice professional skills through accompanying practical work at enterprises; Encourage lecturers to obtain international certificates in the field of logistics. Thereby improving the capacity of lecturers; progressing to bring lecturers to the level of experts, able to analyze, evaluate, advise, and orient businesses. In addition, training institutions can attract practical trainers in the field of logistics; develop standards of knowledge and improve the qualifications of these lecturers. Training institutions need to step up investment in developing a system of physical and technical facilities to serve the needs of logistics human resource training, such as ensuring a complete system of textbooks and reference materials; conditions of learning, practice, equipment and machines, simulation software systems to support learning that follows business reality.

Training methods, lack of interaction, lack of practicality, increase the risk of falling behind and having to re-train, or even be dismissed right after graduation by diversifying training methods, resulting in a combination of centralized formal training with distance training, long-term training with short-term training, training at schools combined with practical training at enterprises. Bringing high-tech science and technology programs into logistics training at universities to match actual requirements. Universities in Vietnam need to learn from and experience logistics training from overseas universities in building innovation centers closely linked with businesses. Thanks to these centers, the universities themselves as well as the businesses benefit. On the school side, students will be able to study in an environment close to reality; on the business side, they will find high-quality human resources in the future.

Besides, in the context of the lack of training resources (especially the teaching staff at schools and the training instructors at enterprises) concentrated only in big cities, while the need for learning and training is common across the country, it is very important to invest in building an online logistics training platform (E-platform) where learning and teaching materials are shared, a network connecting lecturers and learners, e-learning, connecting training institutions and recruiting enterprises in accordance with the trend of the sharing economy. Strengthen cooperation between schools and schools; promote the connection between universities and vocational colleges with short-term training courses; encourage joint training and mutual recognition of credits. Closely cooperate with enterprises in the training process by inviting enterprises to contribute ideas to develop and modify training programs, participate in teaching practical practical modules in training programs; participate in research and evaluation of the university's research works; implementation of consulting packages on logistics activities for enterprises; call to support actual locations, internships for students.

In addition to focusing on improving vocational knowledge and skills at the current stage, training institutions also need to properly assess the impact of social, business, and technological trends on the demand for logistics human resources to build and develop training programs to meet future requirements. Strengthen career counseling to direct students to love the logistics profession and realize their passion for the logistics industry in the appropriate field. Promote communication, support, vocational education and training, build

many forms of encouragement, such as granting scholarships, supporting teaching and learning facilities, etc., to attract qualified learners to enter the logistics industry. [11]

IV. CONCLUSION

The Industrial Revolution 4.0 is the core foundation for the future development of the logistics industry. It is not only involved in solving logistics problems for large companies and enterprises but also offers start-up companies that can apply and offer breakthrough solutions for each stage of supply in general and logistics, in particular. Therefore, accelerating the process of digital transformation and applying information technology in the logistics service industry to change stagnation, create a breakthrough to improve competitiveness, reduce logistics costs, and increase trade. e-commerce, online trading platform, online payment, are indispensable requirements. At the same time, promote trade promotion activities, attract investment and international cooperation in the field of logistics, take advantage of opportunities brought by new generation FTAs, especially EVFTA, CPTPP and RCEP; take advantage of the wave of investment shift to attract investment in logistics development, especially high-tech application logistics. In addition, there should be a connection between businesses and resources in the logistics industry to focus on developing human resources in both quantity and quality, with professional qualifications, skills, foreign languages, and information technology. Strengthen the promotion, encouragement and support of start-ups, innovation, scientific research and technology development for the development of logistics services.

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Truong Thi Vien, M.Sc. "Opportunities, Challenges And Solutions For Logistics 4.0 Development In Vietnam." *International Journal of Engineering and Science*, vol. 12, no. 6, 2022, pp. 25-30.