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ANALYSIS OF INDONESIA'S READINESS TO ENTER THE ERA OF LOGISTICS 4.0

DAYAN HAKIM NATIGOR SIPAHUTAR[1], YOYO SUDARYO[2], GURAWAN DAYONA ISMAIL[3], RIYANDI NUR SUMAWIDJAJA[4], NUNUNG AYU SOFIATI (EFI) [5] and MOHD HASSAN CHE HAAT[6]

[1, 2, 3, 4, 5] Master of Management Study, Universitas Indonesia Membangun, Bandung, Indonesia.
[6] Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu Kuala Nerus, Terengganu, Malaysia.
Email: [1]Dayanhakimm2001@gmail.com, [2]y.sudaryo2@gmail.com, [3]gurawan.dayona@yahoo.com, [4]riyandinursumawidjaja@gmail.com, [5]ayusofiati24@gmail.com, [6]hassan@umt.edu.my

Abstract:

Technological developments have brought the industrial world to an integrated Era of Industrial 4.0. There are five main technologies that support the development of Industry 4.0 systems, namely the Internet of Things, Artificial Intelligence, Human-Machine Interface, robotic technology, and sensors, as well as 3D Printing technology. In the end, Industry 4.0 also has an impact on the logistics sector. Industry 4.0 in the era of globalization is meaningless without Logistics 4.0. Logistics 4.0 in a narrow sense implies the network and integration of logistics processes inside and outside trading companies and production facilities, to the decentralized control of real-time logistics networks. To face the Logistics 4.0 era, the Government has now decided to run the National Logistic Ecosystem (NLE) program or the national logistics ecosystem as a digitization platform that can simplify and provide assistance in the entire process of logistics travel documents. Through Presidential Instruction (Inpres) Number 5 of 2020, NLE activities cover the entire territory of Indonesia. However, a year has passed, Batam Logistic Ecosystem as an NLE prototype has not yet succeeded in integrating various logistics applications into one comprehensive platform. Another problem is the lack of coordination and ego-sectoral problems arise. The vision to reduce logistics costs turned out to be a big mistake because it was not customer-oriented. The author's suggestion is to replace this vision with the "Let's Export Movement". The next problem is simplification where Logistics 4.0 is considered something sophisticated and great. Logistic 4.0 should prioritize simplicity with one click of your thumb. The last problem is the absence of synchronization, either data synchronization or synchronization problems.

Keyword: Logistic 4.0; Indonesia Logistic Performance Index; National Logistic Ecosystem; Sislognas, Chart Logistik Indonesia

A. INTRODUCTION

The use of computer technology for manufacturing automation starting in the 1970s marked the third industrial revolution where supervision, recording and monitoring were carried out by computers. The development of computer technology and its devices has been very rapid in the last decade starting Industry 4.0. There are five main technologies that support the development of Industry 4.0 systems, namely the Internet of Things, Artificial Intelligence, Human-Machine Interface, robotic technology, and sensors, as well as 3D Printing technology.

This adaptation specifically includes the key features of industry 4.0 such as: Networking, Decentralization, Capabilities, Real time and Service orientation. Only by successfully

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implementing Logistics 4.0 can companies create the foundations needed to master the future challenges of Industry 4.0. Logistics 4.0 in a narrow sense implies the network and integration of logistics processes inside and outside trading companies and production facilities, to the decentralized control of real-time logistics networks.

The keywords of logistics 4.0 are digitalization, Internet of Things (IoT) and Internet of Service (IOS), automation and real time, and artificial intelligence. In the era of Logistics 4.0 (Cyber Physical System) a complex global supply chain network was formed, stakeholders connected and interacted using the internet (open and flexible operation footprint). All incoming logistics activities are managed and controlled in real time using the internet.

In Indonesia itself, the term Logistics 4.0 is buzzing. This is related to the development of Indonesia's trade which is increasingly flooded with imported goods. From the description above, questions arise about Indonesia's readiness to face the era of Logistics 4.0. In answering this question, the analysis is directed at the readiness of the Government of the Republic of Indonesia to integrate various logistical applications into one aligned platform.

The next problem is the presence of coordination in implementing Logistics 4.0 by releasing sectoral egos. Another problem is the presence of simplification in the application program so that it is user-friendly and easy to plug and play. The last problem is the presence of synchronization, both data synchronization and problem synchronization so that the implementation can run in harmony.

B. CONCEPT THEORY

The term Industry 4.0 first appeared in the European Parliamentary Research Service (Davies, 2015) which states that the industrial revolution is happening for the fourth time. The first industrial revolution occurred in England in 1784 where there was the invention of the steam engine so that mechanization began to replace human work. The second Industrial Revolution emerged at the end of the 19th century where production machines that were originally run by steam power were replaced by electric power so that productivity increased. The use of computer technology for manufacturing automation starting in the 1970s marked the third industrial revolution where supervision, recording and monitoring were carried out by computers.

The development of computer technology and its devices has been very rapid in the last decade starting Industry 4.0. There are five main technologies that support the development of Industry 4.0 systems, namely the Internet of Things, Artificial Intelligence, Human-Machine Interface, robotic technology, and sensors, as well as 3D Printing technology. In the end, Industry 4.0 also has an impact on the logistics sector. According to the Head of the Kadin Standing Committee for Supply Chain Logistics and HR, Nofrisel, logistics service providers will compete to reduce tariffs with the implementation of Industry 4.0 in increasing competitiveness.

Industry 4.0 in the era of globalization is meaningless without Logistics 4.0. Logistics 4.0 in a narrow sense implies the network and integration of logistics processes inside and outside

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trading companies and production facilities, to the decentralized control of real-time logistics networks. Suitable solutions include Cyber-Physical Systems (CPS), which consist of embedded systems interconnected via communication networks. Humans and materials act as "end points". Other components used include assistance systems such as devices with autonomous intelligence and decision-making capabilities such as cameras, detectors, and self-driving cars.

This adaptation specifically includes the key features of industry 4.0 such as: Networking, Decentralization, Capabilities, Real time and Service orientation. Only by successfully implementing Logistics 4.0 can companies create the foundations needed to master the future challenges of Industry 4.0. For example, paperless transportation order processing with digital Waybills or pallet exchange in the digital age are essential basic requirements for industry 4.0 to function properly. This also applies to Logistics 4.0.

Change and development is a necessity, including in the world of business and industry. Trends in the business world and industry change dynamically so that the level of competition changes. In the past, business competition occurred between products and then changed to between companies and today competition occurs at the level between networks. The industrial development marked by the industrial revolution 4.0 is one of the triggers for major changes in various aspects of human life. These developments also have a major impact on various logistics activities such as transportation, warehousing, customer relationship management (CRM), and supplier relationship management (SRM).

Logistics is a discipline related to managing the flow of goods, information, and money starting from procurement, storage (warehousing and inventory), and delivery service (transportation and customer service) of goods according to the type, quantity, quality, time and place desired by consumers from point of origin to point of destination effectively and efficiently. Logistics is an integral part of the supply chain. Supply chain includes the process of transforming raw materials into products and delivering goods to customers, while logistics includes the movement of materials in the supply chain. Logistics 4.0 is the integration of logistics and digital innovation with the use of information and communication of technology (ICT) supported by a cyber-physical system (CPS). CPS is a physical and engineering system whose operations can be monitored and coordinated.

Logistics 4.0 focuses on the use of innovative new technologies, such as forecast-based supply chain management. With this and other new technologies, the following key logistics figures can be optimized namely, Delivery reliability, Delivery quality, Delivery flexibility, Shipment/shipping capability and Service level. To achieve this, companies must create and implement new concepts for planning, controlling, monitoring, and implementing information and material flows in Logistics 4.0. The goal is to include all levels of enterprise logistics in digital transformation and to identify the right technology for optimization.

The keywords of logistics 4.0 are digitalization, Internet of Things (IoT) and Internet of Service (IOS), automation and real time, and artificial intelligence. The world of logistics itself is also experiencing its evolution. Starting from Logistics 1.0 (Mechanization) where the logistics

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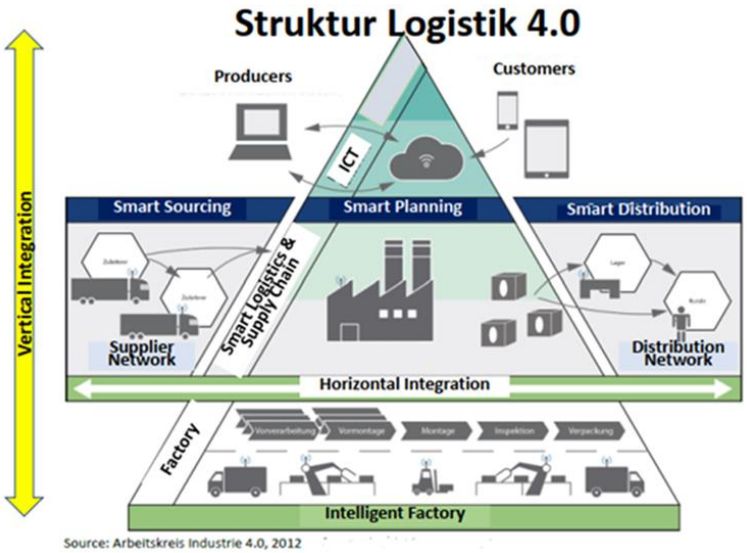
network still uses a simple logistics system, logistics activities have not been integrated and the logistics network has not been formed (the operating structure is still local). Using a push delivery process system, material planning, implementation and control are done manually and are still being done by insourcing. Intralogistics activities (trolleys, forklifts, etc.) are carried out mechanically and controlled manually. Warehousing and inventory activities are carried out and controlled manually (without automation). The means of transportation are driven by "steam engines" and are not coordinated.

The next era is Logistics 2.0 (Electronization) where an integrated logistics network has been formed, the development of a global logistics network and supply chain management has begun. Using a push delivery process system, planning, implementation and control electronically and outsourcing begins. Intralogistics activities including material handling systems (trolleys, forklifts, etc.) are carried out by electric power but controlled by human power. Warehousing and inventory activities begin to be planned, executed and controlled automatically by company. The means of transportation are driven by a "steam engine" and are coordinated.

In the era of Logistics 3.0 (Digitalization), a global logistics network began to form and already uses computers for managing and controlling resources (partial global resource planning / controlling). Incoming logistics are planned and controlled with automated software (e-procurement, e-warehousing, etc.). Intralogistics activities are carried out automatically, including the use of robots for material handling with programmed routes. There is a network of automated warehousing in supply chain activities. Warehousing and inventory activities are planned, executed, and controlled using software. Coordinated transportation facilities, both planning and scheduling are carried out using software.

Figure 1: Logistics 4.0 Structure



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It was only in the era of Logistics 4.0 (Cyber Physical System) that a complex global supply chain network was formed, where stakeholders were connected and interacted using the internet (open and flexible operation footprint). All incoming logistics activities are managed and controlled online and in real time using the internet. Intralogistics activities are carried out completely automatically and programmed according to incoming and outgoing logistics predictions. No warehousing required, inventory is managed "on time" (no warehousing in the supply chain). The means of transportation using drones that are programmed using the internet platform.

In Indonesia itself, the term Logistics 4.0 is buzzing. This is related to the development of Indonesia's trade which is increasingly flooded with imported goods. From the description above, questions arise about Indonesia's readiness to face Logistics 4.0.

In an effort to improve public services, the term KISS has been known, namely coordination, integration, simplification and synchronization. Coordination includes the issue of unity of command and service to public needs. Currently, many local governments have implemented a one-stop service system to solve coordination problems. This is important so that there is one direction when a problem arises so that solutions can be immediately identified and decisions can be made quickly by the competent authorities.

Integration is the second keyword where various aspects of services are combined into one form of integrated service to increase service capacity to stakeholders. Various procedures are combined in one integrated and comprehensive procedure so as to accelerate service delivery to stakeholders.

Simplification in integrated procedures is the third keyword to make it easier for stakeholders to take advantage of services organized by government agencies so as to speed up the document process and simplify procedures that are integrated into one such service. For further synchronization is needed, both data synchronization and synchronization problems.

C. DISCUSSION

Logistics performance in Indonesia itself is not good enough. Referring to the Logistics Performance Index issued by the World Bank in 2018, it was stated that Indonesia was ranked 46th under Malaysia which was ranked 41st.

However, the complex geographical conditions in Indonesia present its own challenges in a logistics business. The good news is that the Government of Indonesia has invested in infrastructure, which helps solve logistical problems. As a result, Indonesia's Logistics Performance Index increased from position 63 to position 46 out of 168 countries.

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Country	Year	LPI Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
Malaysia	2018	41	3.22	2.90	3.15	3.35	3.30	3.15	3.46
Greece	2018	42	3.20	2.84	3.17	3.30	3.06	3.18	3.66
Oman	2018	43	3.20	2.87	3.16	3.30	3.05	2.97	3.80
India	2018	44	3.18	2.96	2.91	3.21	3.13	3.32	3.50
Cyprus	2018	45	3.15	3.05	2.89	3.15	3.00	3.15	3.62
Indonesia	2018	46	3.15	2.67	2.89	3.23	3.10	3.30	3.67
Turkey	2018	47	3.15	2.71	3.21	3.06	3.05	3.23	3.63
Romania	2018	48	3.12	2.58	2.91	3.18	3.07	3.26	3.68
Croatia	2018	49	3.10	2.98	3.01	2.93	3.10	3.01	3.59
Cote d'Ivoire	2018	50	3.08	2.78	2.89	3.21	3.23	3.14	3.23
Mexico	2018	51	3.05	2.77	2.85	3.10	3.02	3.00	3.53

Source: World Bank

Based on the table, it can be seen that Indonesia's worst score is in Customs (2.67), not tracking and Tracing (3.30). This means that Indonesia's logistics problems are not in Indonesia's readiness for Logistics 4.0. In fact, Tracking and Tracing Indonesia's value above Malaysia (3.15). This means that in fact the Indonesian logistics world does not face the problem of Tracking and Tracing, but the Directorate General of Customs itself is a problems and needs to be addressed immediately.

However, to face the Logistics 4.0 era, the Government has now decided to run the National Logistic Ecosystem (NLE) program or the national logistics ecosystem as a digitalization platform that can simplify and provide assistance in the entire process of logistics travel documents. With the implementation of NLE, it is hoped that Indonesia's ranking can rise to 3rd position in ASEAN in the Logistics Performance Index (LPI).

“Currently in ASEAN we are number five and number 46 in the world. With the NLE, it is hoped that we can enter the top 30 in the world. If we enter the top 30, it means we can rank 3 in ASEAN," said the General Chairman of the Indonesian Logistics and Forwarders Association (ALFI) Yuki Nugrahawan Hanafi in a virtual press conference, Thursday (24/9/2020). He hopes that, before the existence of ASEAN Connectivity, Indonesia can be ranked 3rd, so that investment in ASEAN can also be enjoyed domestically. "Hopefully before ASEAN Connectivity we can go there, so we can enjoy the investment cake in ASEAN," he said.

Through Presidential Instruction (Inpres) Number 5 of 2020, NLE activities can cover the entire territory of Indonesia. Thus, all stakeholders will implement regulations and commitments to improve Indonesia's competitiveness. The government's goal in establishing ekolognas is to reduce logistics costs, which are said to be still struggling from 23.5 percent to 17 percent. Thus, Indonesia can compete with other countries, in Asean, which have even reached single digit logistics costs.

The government does not plan to form a new agency that manages logistics or a special agency that manages platforms or barriers for the national logistics ecosystem. Meanwhile, the Directorate General of Customs (DJBC) as the person in charge is deemed sufficient. Secretary

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of the Coordinating Ministry for Maritime Affairs and Investment Agung Kuswandono said discussions regarding the existence of a separate institution had existed since the establishment of the Indonesia National Single Window (INSW).

The most important thing, he explained, is not a new institution but a commitment that must be maintained together. "In the past, Indonesia had INSW, the journey emerged online single submission [OSS], now we come up with another idea called the National Logistic Ecosystem [NLE], the most important thing is not to be legitimized as a new institution or secretariat," he explained, (Bisnis Indonesia, 1/10/ 2020). According to him, if a new institution is formed, a sectoral ego will emerge. He emphasized that in NLE what is important is that the joint commitment must be new. "All parties must be able to synergize to convey their sales in NLE, both government and business. DJBC is enough to be a leader, combining existing platforms," he said. Agung said, if the NLE prototype in Batam could run well and could be replicated in other areas, then a new institution was needed to manage all these activities. Since last year, Batam Logistic Ecosystem (BLE) has been designated as an NLE pilot project with the Director General of Customs as the leader.

A year has passed but Indonesia's logistics world has not changed much. The pilot project has never been implemented in other regions in Indonesia. This is due to several things. The first is Integration problem. Logistics 4.0 is not about creating a sophisticated application system that has hundreds of great features.

Logistics 4.0 is to integrate various application systems into one integrated system with the use of information and communication of technology (ICT) supported by a cyber-physical system (CPS). The platform was created not only to supervise logistics service providers, which in a narrow sense is a large number of forwarding. Meanwhile, to integrate only a few shipping line into the Indonesia National Line has not been successful so far. If the focus is only on forwarding, there will be no added value for the Indonesian economy.

Platforms such as the one in the Sea Toll Program can be imitated and then developed into a National Logistics Ecosystem. The platform that is built must be open source so as to facilitate connectivity, such as with Indoportnet, National Single Windows or Electronic Data Interchange. Instead of making it difficult for service users, they have to build new systems for their respective applications. For that, the Director General of Taxes needs to give his thumbs up with his e-SPT.

The next problem is coordination. Since 2012, the Ministry of Transportation – Director General of Sea Transportation has started to build a National Logistics System which has never been realized until now. Suddenly, in Presidential Instruction Number 5 of 2020, the coordinator was transferred to the Director General of Customs. This is a question for business people in the logistics world. The so-called sectoral ego emerges. Each party becomes more concerned with their respective interests.

The main thing is the laying of the vision of Logistics 4.0 itself. The vision to reduce logistics costs turned out to be a big mistake. Why? Because it is not customer oriented. The author's suggestion is to replace this vision with the "Let's Export Movement". In addition to more time

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with customers, it can also improve the Indonesian economy. People feel more cared for and well served. Starting from small industrial centers such as Cibaduyut shoes, Pekalongan batik, Cirebon Batik Trustme, Lawean batik, Cimahi textiles, Bitung canned fish to Tegal scrap metal industry will feel served. The Director General of Customs does not have data on sectoral industries in the region except for the cigarette industry.

Actually, what the Director General of Sea Transportation has built with the Sea Toll Program can already be an early example of Logistics 4.0 on a small scale. Owners of goods who are generally weak entrepreneurs will be increasingly noticed. Procurement only manages the supply chain from the vendor to the raw material warehouse. Forwarding only does trucking and cargodoring from door to port. Stevedoring only does loading from the sea way to the ship. Shipping is only for port to port delivery. Marketing only performs channel distribution management from the factory to the final customer. Everything is done proportionally. This is what happens when a blind man tries to explain elephants.

Coordinators must be in the Ministry of Trade in their respective regions. Those who know better about the trading situation in their area. Starting from the production of goods, trade of goods in and out to business people in the area. By changing the vision to the Let's Export Movement instead of reducing logistics costs, of course it will be more beneficial for the community directly.

The next problem is simplification. Head of the Standing Committee of the Chamber of Commerce and Industry (Kadin) for Logistics, Supply Chain and HR, Nofrisel said there are a number of main challenges in the Industrial Revolution 4.0 that must be overcome by national logistics businesses. According to him, uses through automation, artificial intelligence (AI) technology, and the internet of things (IoT) are considered to have an effect on industrial performance which will automatically affect the performance of national logistics and supply chains.

He gave an example, currently there are many logistics companies that do not have any assets but can later become important players in the logistics sector. "That's because of the encouragement and strength of an advantage that is obtained from the use of modern technology. On average, all logistics activities have been connected to all technology-based things," he said, Wednesday (5/9/2018).

Some of the current logistics business activities such as warehousing, transportation, shipping, and ports, according to him, have been connected by a technology-based system. "Well, this makes our competitiveness more competitive. However, there are still disruptions or impacts that must be taken into account," he said.

This impact can occur if logistics business players do not have adequate knowledge to face the Industrial Revolution 4.0, especially in the logistics sector. He also said that with the carrying capacity of this technology, logistics business players should compete to reduce tariffs considering that this business will run in a competitive and tight manner. "Indeed, the demands after using technology, the implication is that (lowering tariffs)," he said.

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The fourth problem is synchronization. Following the example of the Sea Toll Program, regular meetings are often held between agencies or with service providers which are carried out with the aim of synchronizing, both to equalize perceptions of the problems that occur and to equalize data with each other. Unlike what is happening now where only one party feels the most important and the most meritorious.

With this, of course, the obstacles in the value of Customs are also resolved. Why is the Customs value score problematic why it is even given the power to control the integration platform. Barriers to the movement of goods at the port should be resolved immediately and decisions can be made immediately. Unlike now, differences of opinion between end consumers, forwarding and the Director General of Custom regarding the imposition of import tariffs must be brought to the Tax Court which can only be resolved after 3 years.

D. CONCLUSIONS

To face the Logistics 4.0 era, the Government has now decided to run the National Logistic Ecosystem (NLE) program as a digitization platform that can simplify and provide assistance in the entire process of logistics travel documents. Through Presidential Instruction (Inpres) Number 5 of 2020, NLE activities can cover the entire territory of Indonesia. However, a year has passed, Batam Logistic Ecosystem as a prototype of NLE has not yet succeeded in integrating various logistics applications into one comprehensive platform. There are still many government agencies and service units that are not willing to let go of their application programs in NLE.

Another problem is the lack of coordination and ego-sectoral problems arise. The vision to reduce logistics costs turned out to be a big mistake because it was not customer-oriented. The author's suggestion is to replace this vision with the "Let's Export Movement". The next problem is simplification where Logistics 4.0 is considered something sophisticated and great. Logistics 4.0 should prioritize simplicity with one click of your thumb. The last problem is the absence of synchronization, either data synchronization or synchronization problems.

If the problems of Integration, Coordination, Simplification and Synchronization can be solved, then the platform that has been aspired to since 2012 will soon be realized. Sislognas or the National Logistics Ecosystem or whatever it is called will be very beneficial for the Indonesian economic community.

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BIOGRAPHY

- Dr. Dayan Hakim Natigor Sipahutar SE.AK.MM.CA., Born in Jakarta August 19, 1967, NIDN 0419086707, Last Education S3 DMB Program Padjadjaran University, Now a permanent Lecturer at Program MM Universitas INABA Bandung, Indonesia.
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