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NEW CHALLENGES FOR LOGISTICS IN THE CONDITIONS OF MILITARY OPERATIONS

Dmytro Bugayko, Volodymyr Reznik. "New challenges for logistics in the conditions of military operations". *The logistics sector was one of the most important and key during the martial law and underwent significant changes. A survey conducted by Kievstar Business Hub in 2022 and 2023 showed the dynamics of the development of the logistics sector during the war. For example, last year, one of the main reasons for business closures was the disruption of the logistics chain. This year, it is no longer a priority as companies gradually adapt to the challenges of wartime. The state of logistics at the beginning of the full-scale Russian invasion of Ukraine was difficult. But it becomes clear that the direction is slowly recovering in 2023, because the number of professional offers in the industry is increasing. This, of course, is somewhat less dynamic compared to the labor market in general. However, it is positive. But there were also some challenges occurred to the logistics and supply chain management of industries and enterprises. A lot of them will be researched during the article.*

Keywords: transport system, cargo transportation, multimodal transportation, optimization processes, routes planning, delivery scheme modelling.

Дмитро Бугайко, Володимир Резнік. «Нові виклики для логістики в умовах бойових дій». *Сфера логістики була однією з найважливіших і ключових під час воєнного стану і зазнала значних змін. Опитування, проведене Kievstar Business Hub у 2022 та 2023 роках, показало динаміку розвитку сфери логістики під час війни. Наприклад, минулого року однією з головних причин закриття підприємств було порушення логістичного ланцюжка. Цього року це вже не є пріоритетом, оскільки компанії поступово адаптуються до викликів воєнного часу. Стан логістики на початку повномасштабного російського вторгнення в Україну був складним. Але стає зрозуміло, що напрямок відновлюється у 2023 році, адже кількість професійних пропозицій у галузі зростає. Це, звичайно, дещо менш динамічно, порівняно з ринком праці в цілому. Проте, це позитивно. Але також виникли деякі*

проблеми з логістикою та управлінням ланцюгом поставок галузей і підприємств. Багато з них будуть досліджені в ході статті.

Ключові слова: транспортна система, вантажне перевезення, мультимодальне перевезення, процеси оптимізації, планування маршрутів, моделювання схеми доставки

Introduction. The industry faced difficulties not only during the war years. But now the situation is constantly changing and there is a need for quick and effective decision-making. What are the challenges facing logistics in peacetime? - Inventory management - the more inventory, the greater the amount of frozen financial resources. - Search for suppliers and delivery to warehouses - typical conflicts regarding volumes, terms of supply and supplier selection. - Basic conditions of supply - risks, costs, exchange of documents and other issues between counterparties. Logistics is a dynamic industry, and its effective operation requires an experienced management team. The above-mentioned problems are complicated by the conditions of martial law. Currently, it is impossible to keep goods in stock for a long time - in the event of an attack, they are lost. - Change of storage conditions. Warehouse deployments typically take around three months, but now they should be ready to organize secure and integrated warehouses within 7-14 days. - Increasing the complexity of logistics operations. Roadblocks, checks, non-transparent restrictions on movement during the curfew. - Sudden changes in routes. It is necessary to plan backup routes in advance in case of new attacks.

The main challenge for Logistics during the war are challenges in supply chain and multimodal transportation of goods. Multimodal transportation is the transportation of any goods by two or more modes of transport, organized by one Logistics Company. Carriers are allowed to tow delivery vehicles belonging to other companies. Intermodal transport is the transportation of goods under a single contract by at least two means of transport; the carrier is responsible for the entire

transport, even if the transport is carried out by different means of transport (e.g. rail, sea, road, etc.). The main objective of the transport company and its personnel in intermodal transportation is to deliver the goods ordered by the manufacturer safely, completely and on time. [1]. The article is a logical continuation of a number of publications devoted to the development of multimodal transportation development of Ukrainian scientists Y. Kharazishvili [2, 3, 5], D. Bugayko [2 – 6], A. Antonova [5], M. Hryhorak [4], Y. Ierkovska [6], O. Ovdienko [4], V. Marchuk [5], V. Lyashenko [3], Polish scientists Z. Zamiar [5] and scientists of other countries..

The purpose of the article is to provide research is to provide the theoretical foundations and problems and challenges of managing logistics industry and to develop ways and project recommendations to avoid the additional risks for logistics sphere and 3PL logistic companies during the martial law. Sometimes the exact samples will be used (on the example of Freight Forwarding Organization "Freight Transport Partner, who is the 3PL provider of Logistics Services).

Presentation of the main results. In wartime, new methods and processes need to be found as quickly as possible. Only experienced managers with experience in different niches and projects can do this. How to solve the problems facing the industry - useful tips based on the example of Freight Transport Partner interaction with Ukrainian businesses. There are several variants of ways for increasing the operational results of the Logistics company during the martial state.

1) Attract top managers with experience in different niches. (The more examples, the better the variability of results)

2) Ability to choose between main action, backup and emergency options. –

3) Re-establish and improve efficiency.
 (Outsource logistics processes and have a
 coordinated team already working on them.)

Table 1. Offers of the risks affecting on micro-level of Logistic enterprise during the martial law

A group of risks during the martial state	Brief description	Ways to avoid the risks:
1. Operational risks	1) Spoiling and damaging cargo during transportation:	Correct packing of the cargo, following the conditions of cargo transportation, trying to fit the time limit for handling of the special cargo
	2) Appearing of some delays and short comes during the cargo transportation process	Correct and experienced planning during the cargo transportation, taking into account factors influencing such incidents (such as queues on border (dangerous goods are handled without queues) hiring of the experienced cargo brokers, to avoid mistakes in declaration), additional profit to compensate consignee the delay.
	3) Risk of stealing the cargo	Correct route and itinerary planning, correct cargo insurance covering all the possible risks, using secure parking lots (in case pf cargo transportation).
	4) Risks of additional costs appear	Correct documents processing, (estimation of price and value of the cargo in advance) because it directly influences the prices and procedures on border.
	5) Risk of losing the customer before loading	Remain the contacts of your partner and sub-contractors confidential before signing the agreements
2. Non-operational (external)	1) The cargo and warehouse is being attacked	Moving distribution centers abroad or in remote place from fighting operations, but in direct company can not fully influence this factor
	2) Delays in payments in the side of customer or nascence of payment at all	During such difficult situation in economy and country in general delays in such kinds are also able to appear. Logistics company works always with payment in advance or payment before fully unloading the cargo.
	3) Risk of cooperation with swindlers	Hiring experienced lawyer, checking the basic documents of customer company, contacting not only with one officer of the receiving company.

Source: Developed by Dmytro Bugayko, Reznik Volodymyr

4) If the company is experienced,
 organize work and staff immediately and

select employees for linear processes. - Track
 mile by mile. In case of air transportation

freight-forwarding) If each flight has a dedicated manager, non-standard situations can be resolved very quickly. - Outsource registration. Take on cargo storage, processing and delivery, as well as customs clearance, broker registration and profit representation before licensing authorities.

5) Find and organize a new storage warehouse with security and management systems.

Secure line workers in advance and 'reserve' additional sites for shipments. (it suits for all kinds because unloading and changes of documents are also applicable for truck transportation of transportation).

When organizing the delivery of dangerous or perishable goods, the main goal is to ensure the efficiency of the entire process, including minimizing costs, applying competitive tariffs and ensuring the integrity of the cargo. In other words, the main factors affecting the overall performance of a logistics provider are cargo, delivery process and efficiency. When delivering certain types of cargo, there are significant differences in the organization of delivery of various types of special cargo, as each of these elements has

its own characteristics, which are considered separately. Existing types of containers and packaging, as well as containers, can be used to organize transportation of perishable and dangerous goods and to form cargo units with different volume and mass characteristics. The task of determining the optimal size and number of cargo units is key both for risk management and for improving the efficiency of cargo delivery systems that have both dangerous and perishable characteristics. The use of stronger containers designed for longer transit times and packaging with more refrigerants can increase the total delivery time if the probability of cargo damage is constant, or reduce the probability of damage if the delivery time is constant. In addition, more reliable packaging with more refrigerants ensures the integrity of the cargo in case of irregular fluctuations in the ambient temperature or violations of the delivery technology.

In addition to such factors and risks the war condition added the new one challenges, which are described by the author at the Table 2.

Table 2. Dynamics of volumes of cargo transportation by types of transport in Ukraine, million tons, comparing the pre-war period and martial state.

№	Type of transport	Years									2022 in % by 2021
		2013	2014	2015	2016	2017	2018	2019	2020	2021	
1	Total of all transport including:	1837	1623	1474	1543	1582	1643	1579	1641
2	Rail	444	386	350	343	339	322	322	306	314	102,9
3	Road	1261	1131	1021	1086	1122	1206	1206	1232
4	including car companies	126	131	109	123	126	134	190	152	224	147,4
5	Sea	3	3	3	3	2	2	2	2	2	95,2
6	River	3	3	3	4	4	4	4	4	4	96,7
7	Air	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	92,7
8	Pipeline	126	100	97	107	115	109	113	97	78	79,6

Source: State statistics service-[Electronic source]-Link- <https://www.ukrstat.gov.ua>.

Developed by: Reznik Volodymyr, Bigaiko Dmytro

Some conclusions can be made out of this Tanle above such, as the war clearly revealed the shortcomings of the current situation. First, large volumes of cargo are stored only in certain parts of the country and routes that pass near dangerous areas and strategic objects are used. Logistics should be more integrated. After all, this approach turned out to be the only way to survive in times of crisis. Reorganization of storage systems, anticipation of risks and development of new routes will be the starting point for the post-war recovery of logistics. Optimizing freight insurance coverage is only one of the measures to minimize risks. The main measures are prevention and risk management. Supply chain security is now recognized as a theoretical approach to transport logistics. In this context, the organization of safe delivery of goods, including such key aspects as ensuring the integrity of the goods and

compliance with deadlines, has become of great importance. Ensuring the integrity of the cargo at any stage of transportation is of great importance, as it affects further processes. Therefore, ensuring the integrity of cargo during transportation is one of the main preventive measures for carriers to avoid risks and potential losses. Implementation of various measures to reduce risks requires sufficient costs. In order to choose specific risk reduction methods, it is necessary to compare the level of risk with the costs of risk prevention and management.

According to the Customs of trade and International conventions of Cargo Transportation, The International commercial terms and trade are applicable in conflict situations (including war conditionals, if the previously signed agreement didn't solve such problem (see Table 3).

Table 3. The most popular terms and abbreviations of international trade applicable to solve the incidents with cargo during transportation

Abbreviation of the term	Key moments	Application at transport modes and ways of delivery	Application by type of cargo
EXW	Transportation is fully paid by purchaser The risk is transported from purchaser to buyer since the obtaining the cargo Carrier is not responsible for cargo since the moment of transferring it to the purchaser	Air transportation Railway transportation Maritime transportation Multimodal transportation	General cargo Group age traffic Full-container load Bulk cargo Dangerous cargo
FCA	The carriage is fully paid by the purchaser of cargo, the risks are transferred to the purchaser since the transferring of the cargo at the previously agreed place. The costs are transferred to the seller since the moment of cargo transferring	Air transportation Maritime transportation	General cargo Group age traffic Full-container load Bulk cargo
CPT	Carriage totally prepaid The risks are transferred from seller to buyer since the cargo transferring to carrier,	Air transportation Railway transportation Maritime transportation	General cargo Group age traffic Full-container load Bulk cargo

	the purchaser is engaged in compensation of the risks that are not previously written in agreement Seller is not responsible for the cargo after it's receiving by the purchaser	Multimodal transportation	Dangerous cargo
DDU	Carriage is paid by the seller, risk is transferred during the location of cargo at harbor, costs are transferred from seller to buyer until the moment of carriage at definite place	Air transportation Maritime transportation Mixed transportation Automobile transportation	General cargo Group age traffic Full-container load Bulk cargo Dangerous cargo

Source: Incoterms-2020

The survey revealed two areas in which misunderstandings most often occur. Misunderstanding of Incoterms terms. The first is a misunderstanding of Incoterms, which is that Incoterms are rules that apply to contracts of carriage, not contracts of sale. It is a common misconception that there are rules that apply. Second, it is sometimes thought that Incoterms covers all obligations associated with contracts of sale. Incoterms are sometimes considered to cover all obligations that the parties wish to include in the contract. Sometimes they are considered to cover the following. However, as always emphasized by the ICC, Incoterms apply only to the relationship between the seller and the buyer under the contract of sale. However, as always emphasized by the ICC, Incoterms apply only to the relationship between the seller and the buyer under the contract of sale. Only in certain clearly defined aspects. Exporters and importers should consider the

following points. Exporters and importers need to take into account the practical relationship between the various contracts necessary for the implementation of international trade transactions. In international trade transactions, not only sales contracts are used, but Incoterms are applied not only to sales contracts, but also to transport, insurance and other contracts. transport, insurance and other contracts, as well as insurance contracts and financing agreements. Incoterms relate to only one of these contracts, namely the contract of sale.

In spite of all the new challenges for Logistics, during the war period, the sphere is developing, some increasing are also occurred, according to the biggest work site in Ukraine, the sphere is highly growth comparing with the previous period. The results are represented by the Author.

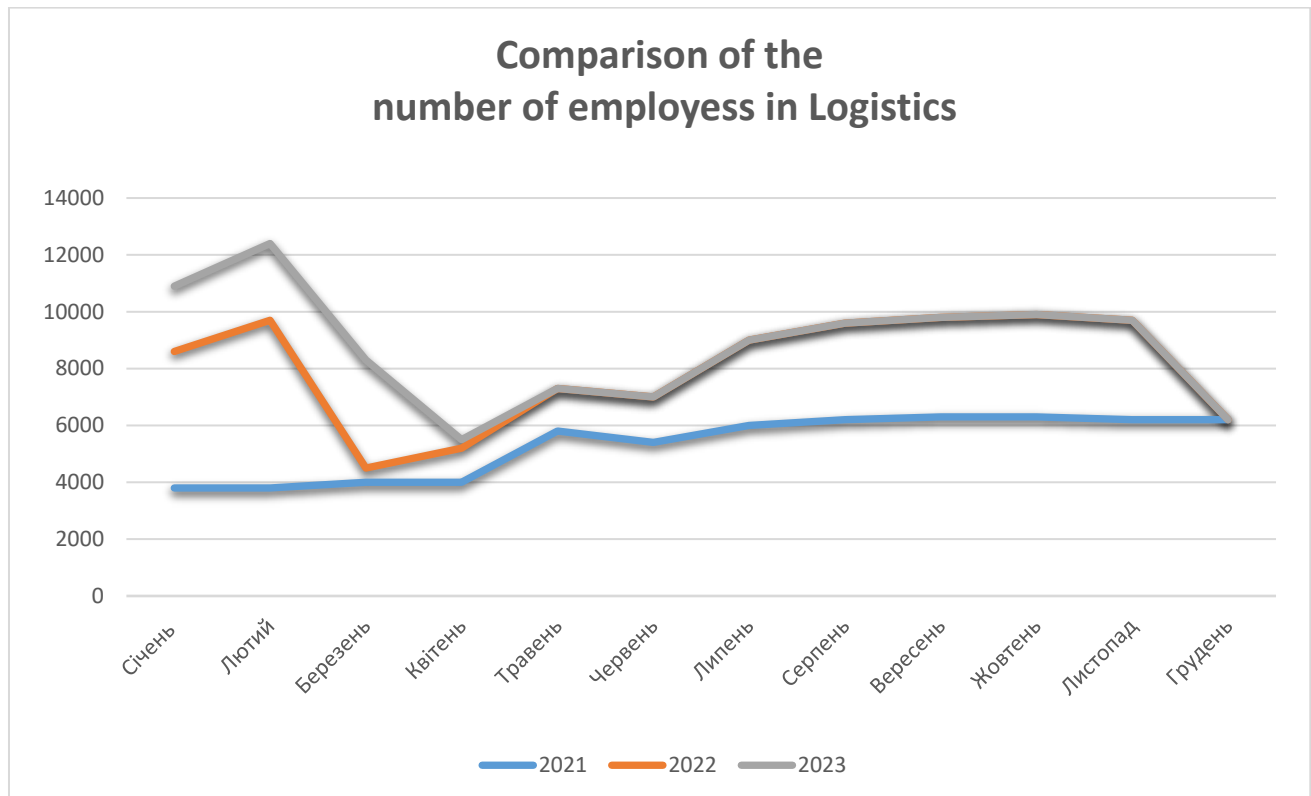


Figure 1 – Comparison of number of employees (2021,2022 and part of 2023)

It can be clearly seen from the Figure, that the employment in Logistics has the positive dynamics, in spite of war and other circumstances. There is the lack of professional logisticians, because the absence of experience.

Conclusions.

During the researches of the 3-PL companies-providers of Logistics services, such conclusions for sustainability of the Logistics enterprise revealed. There are several variants of ways for increasing the operational results of the Logistics company during the martial state.

1) Attract top managers with experience in different niches. (The more examples, the better the variability of results)

2) Ability to choose between main action, backup and emergency options. –

3) Re-establish and improve efficiency. (Outsource logistics processes and have a coordinated team already working on them.)

4) If the company is experienced, organize work and staff immediately and select employees for linear processes. - Track mile by mile. In case of air transportation

freight-forwarding) If each flight has a dedicated manager, non-standard situations can be resolved very quickly. - Outsource registration. Take on cargo storage, processing and delivery, as well as customs clearance, broker registration and profit representation before licensing authorities.

5) - Find and organize a new storage warehouse with security and management systems.

Secure line workers in advance and 'reserve' additional sites for shipments. (it suits for all kinds because unloading and changes of documents are also applicable for truck transportation of transportation). Today, Ukraine controls the largest ports, which account for more than 85% of sea cargo handled: Mykolayiv, Orviy, Odesa, Black Sea and Southern ports. Three smaller ports at the mouth of the Danube are operating at full capacity and handling increasingly large volumes of cargo: Izmail, Leni and Ust-Dunaisk. In normal times, these ports accounted for less than 5% of exports. Considering the situation in other ports, the region has great potential. Before the

opening of the grain corridor, the country's export logistics depended on it. Ports in the Danube basin can no longer completely replace the volume of business that used to pass through seaports. While the seaports can handle 250 million tons per year, the Danube ports can physically handle only up to 10 million tons; Only small ships and barges can enter the Danube ports, which leads to a decrease in cargo volumes, physically limited cargo delivery areas and higher delivery costs; The low throughput of river ports physically limits cargo flow. However, Ukraine plans to increase the efficiency of the Danube ports by building additional warehouses, berths and transshipment capacities. Freight traffic by rail in 2022 will drop by 65.3 percent. Transportation on the international corridor between Asia and Europe is practically stopped. In addition, it is necessary to take into account the existing significant problems with the export of products caused by traffic jams and bottlenecks. The reasons for this are as follows Limited capacity of checkpoints. Limitation of control procedures by border guards, customs and phytosanitary inspectors of Ukraine and neighboring countries; technical restrictions on changing vehicle carts to a different size (from 1520 mm in Ukraine to 1435 mm in Europe); and Limiting the capacity of railway infrastructure of neighboring countries (shipbuilding factories, capacity of tracks and lines, number of rolling stock); Restrictions at intersections between different modes of transport: European ports cannot process large volumes of grain loaded into wagons; Constraints in storage infrastructure: for example, the physical

absence of warehouses for processing/storage and storage of grain. In 2022, queues at border crossings may reach almost 40,000 wagons. As a result, about 20 percent of cargo waiting to cross the border is in the queue for more than 30 days. As a result, entrepreneurs often suffered losses, as customers refused to accept the cargo due to the risk of damage to the cargo in case of delays in delivery to the final consumer. In addition, cargo owners were charged a fee for each day the car was idle, and sometimes fines were imposed, depending on the terms of the contract. Due to the damage caused by the total war, the Ministry of Land Transport of Ukraine increased tariffs for freight transportation by rail and related services in Ukraine by 70%. Now this rate is reduced to 30%, but this option still remains unprofitable for agricultural entrepreneurs. Their profits will decrease, their working capital deficit will increase, and they will economize on cultivation, abandoning the use of fertilizers and other technologies to increase yields. As a result, until 2023, grain yields will most likely fall. rail traffic in 2022 will drop by 65.3 percent. Transportation on the international corridor between Asia and Europe is practically stopped. In addition, it is necessary to take into account the existing significant problems with the export of products caused by traffic jams and bottlenecks. The reasons for this are as follows Limited capacity of checkpoints. Limitation of control procedures by border guards, customs and phytosanitary inspectors of Ukraine and neighboring countries. All this factors influence on employment in Logistics..

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