

Матеріали XV Міжнародної науково-практичної конференції  
Materials of the 15<sup>th</sup> international scientific and practical conference

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**СУЧАСНІ ІНФОРМАЦІЙНІ ТА ІННОВАЦІЙНІ  
ТЕХНОЛОГІЇ НА ТРАНСПОРТІ**

**MODERN INFORMATION AND INNOVATION  
TECHNOLOGIES IN TRANSPORT**

**MINTT-2023**

Збірка матеріалів конференції

**24-25 травня 2023 року  
Херсон, Україна**

**May 24-25, 2023  
Kherson, Ukraine**

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У збірнику представлено матеріали XV Міжнародної науково-практичної конференції «Сучасні інформаційні та інноваційні технології на транспорті», яка відбулася у м. Херсон 24-25 травня 2023 р. і була присвячена актуальним питанням застосування сучасних інформаційних та інноваційних технологій у транспортній галузі.

Матеріали збірки розраховані на викладачів та студентів вищих навчальних закладів, фахівців науково-дослідних установ та підприємств.

Сучасні інформаційні та інноваційні технології на транспорті (MINTT-2023) [Збірка матеріалів XV Міжнародної науково-практичної конференції (24-25 травня 2023 р., м. Херсон)]. – Херсон : Херсонська державна морська академія, 2023. – 344 с.

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The collection presents the proceedings of the XV International Scientific and Practical Conference «Modern Information and Innovation Technologies in Transport», which took place in Kherson on May 24-25, 2023 and was devoted to topical issues of modern information and innovation technologies in transport sector.

The materials of proceedings are designed for teachers and students of higher educational institutions, specialists of research institutions and enterprises.

Modern Information and Innovation Technologies in Transport (MINTT-2023) [proceedings of the XIII International Scientific and Practical Conference, May 24-25, 2023, Kherson]. – Kherson: Kherson State Maritime Academy, 2023. – 344 p.

## A COMPREHENSIVE ANALYSIS OF INTERMODAL FREIGHT TRANSPORTATION DEFINITIONS THROUGH A MORPHOLOGICAL APPROACH

**Golovko T.V., Demchenko I.S.**

*Ukrainian state university of railway transport (Ukraine)*

**Introduction.** The thesis discusses the concept of intermodal freight transportation and the lack of a clear understanding of its objectives in many definitions. The author aims to address this gap by using morphological analysis and creating a custom definition that includes all the key characteristics and goals of intermodal freight transportation.

**The relevance of the research.** The concept of intermodal freight transportation has been widely discussed in academic and industry circles [1]. Various definitions of this term have been proposed, but many lack a crucial element: the goal of intermodal freight transport. Without a clear understanding of the objectives of intermodal transportation, it is difficult to develop effective strategies for implementing this mode of freight movement.

**The goal of the research.** After conducting an extensive literature review, we applied the morphological analysis method to study the definitions of intermodal freight transportation from various sources. We aimed to identify the key characteristics and goals of this mode of transportation. We found that many definitions of intermodal freight transportation exist, but they do not necessarily include all the essential components of this type of transport. This thesis aims to address this gap in the literature by using morphological analysis to compare existing definitions of intermodal freight transportation.

**The results of the research.** By identifying the keywords, characteristics, and goals in each definition, we can better understand the concept and its intended outcomes. This study will contribute to developing a unified and complete definition of intermodal freight transportation that incorporates the goals of this mode of transport. To provide a comprehensive analysis, we created a custom definition of intermodal freight transportation that includes all the key characteristics and goals. We then compared this definition with those found in the literature and present the results in a table. This analysis allows us to identify gaps and inconsistencies in the existing definitions and provides a more complete understanding of the essential features and objectives of intermodal freight transportation.

Table 1 – The morphological analysis of “intermodal freight transportation” definitions

| <i>Definition</i>   | <i>Keyword</i>                 | <i>Attribute</i>   | <i>Goal</i>  |
|---|--------------------------------|--|--|
| <i>Transportation of goods to one or more destinations using multiple modes of transportation without reloading the cargo when changing the mode of transportation [2].</i> | <i>Transportation of goods</i> | <i>to one or more destinations using multiple modes of transportation without reloading the cargo when changing the mode of transportation</i> |  |
| <i>Logistic service that is carried out using several transport units. The goal is to sequentially deliver cargo by several means of transportation [3].</i>                | <i>Logistic service</i>        | <i>that is carried out using several transport units</i>   | <i>The goal is to sequentially deliver cargo by several means of transportation.</i> |
| <i>Transportation that involves the use of various types of transport and for which the client can enter into a contract with multiple companies [4].</i>                   | <i>Transportation</i>          | <i>that involves the use of various types of transport and for which the client can enter into a contract with multiple companies.</i>         |  |

|  |   |  |   |
|--|---|--|---|
| <i>Combined transportation of your goods using multiple modes of transport, whereby the company assumes responsibility for the entire transportation, even if the delivery is carried out by different modes of transport [5].</i>   | <i>Combined transportation of your goods</i>                          | <i>whereby the company assumes responsibility for the entire transportation, even if the delivery is carried out by different modes of transport.</i>                                  |   |
| <i>The process of moving cargo from place to place using more than one method of transport - truck, rail, plane, ship, or any combination of those. Using intermodal transport, a shipper or buyer contracts with multiple carriers to transport a single container along a route [6].</i> | <i>moving cargo from place to place</i>                               | <i>using more than one method of transport - truck, rail, plane, ship, or any combination of those.</i>  | <i>a shipper or buyer contracts with multiple carriers to transport a single container along a route.</i> |
| <i>It simply means transporting one set of goods in a steel container using two or more modes of transportation, such as rail and truck. Rail and trucks are not the only means of transit that intermodal utilizes [7].</i>   | <i>transporting one set of goods in a steel container</i>             | <i>using two or more modes of transportation, such as rail and truck.</i>  |   |
| <i>This is the transportation of goods without loading and unloading operations in the same cargo unit (for example, in a container) using multiple modes of transportation within the "door-to-door" transport chain [8].</i>   | <i>transportation of goods</i>  | <i>without loading and unloading operations in the same cargo unit (for example, in a container) using multiple modes of transportation within the "door-to-door" transport chain.</i> |   |
| <i>This is the transportation of goods using multiple modes of transportation, where the forwarder organizes the entire transport from one point or port of shipment through one or several transshipment points to the final destination or port [9].</i>                                 | <i>transportation of goods using multiple modes of transportation</i> | <i>where the forwarder organizes the entire transport from one point or port of shipment through one or several transshipment points to the final destination or port</i>              |   |
| <i>Intermodal transportation is defined here as the movements of goods in a load unit between a point of origin and a point of destination, where the unit is transferred at least once from one mode of transport to another between these two points [10].</i>                           | <i>the movements of goods in a load unit</i>                          | <i>between a point of origin and a point of destination, where the unit is transferred at least once from one mode of transport to another between these two points</i>                |   |

Morphological analysis [11] is a method of breaking down complex concepts into their constituent parts or morphemes. This technique is often used in linguistics to study the structure of words and how they are formed, but it can also be applied to other areas such as problem-solving and decision-making. In the context of creating definitions, morphological analysis involves breaking down a complex term or concept into its component parts and analyzing the meaning of each part. By analyzing each component part of the term, we can arrive at a more precise and comprehensive definition of "intermodal freight" as the transportation of goods using

multiple modes of transportation, such as trucks, trains, or ships, in a coordinated manner to maximize efficiency and minimize costs.

In the morphological method of creating definitions, the first step is to identify the keyword, which is the main concept being defined. Once the keyword is identified, the next step is to identify its characteristics or attributes, which help to further specify or describe the keyword. These characteristics may include physical features, functions, uses, or other properties. Finally, the goal or purpose of the keyword is identified, which explains why the keyword is important or relevant. This could be a practical application, a theoretical concept, or a broader significance. Having analyzed the above definitions using the morphological analysis, we've concluded that:

All the definitions refer to the transportation of goods using multiple modes of transportation. They all involve the transfer of cargo from one mode of transport to another during the journey. They all aim to provide a seamless, end-to-end delivery process.

1. Some definitions specify the use of different carriers for each mode of transportation (e.g. "each carrier is issuing its contract"), while others refer to the use of a single carrier or logistics provider (e.g. "firm is responsible for the entire transport").
2. The majority of definitions emphasize the use of specific modes of transportation (e.g. "truck, rail, plane, ship"), while others are more general and inclusive (e.g. "multiple means of transport"). Some authors refer specifically to the transfer of freight, while others include passengers as well.
3. In some cases, theorists mention the need for multiple contracts or tickets for each mode of transport, while others do not.
4. The huge discrepancy is that almost all definitions don't include the goal of the definition, therefore it's not what intermodal freight transportation is aimed at.

Based on the morphological analysis of various definitions of intermodal freight transportation, we've created our definition:

*Intermodal freight transportation refers to the movement of goods using multiple modes of transportation, such as trucks, trains, ships, and airplanes, without the need to handle the cargo when changing from one mode to another. The goal of intermodal freight transportation is to increase efficiency and reduce costs by utilizing the strengths of each mode of transportation while minimizing its weaknesses. It also enables shippers to reach more distant markets, reduce their transportation costs, and improve their overall supply chain performance.*

Summary. In the thesis, we've discussed the concept of intermodal freight transportation and the lack of a clear understanding of its objectives in many definitions. We've aimed to address this gap in the literature by using morphological analysis and creating a custom definition that includes all the key characteristics and goals of intermodal freight transportation. The morphological analysis involves breaking down a complex term into its parts and analyzing the meaning of each part. Based on the analysis of various definitions, we've identified the key characteristics and goals of intermodal freight transportation and presented a more complete and unified definition of this mode of transportation. The goal of intermodal freight transportation is to increase efficiency and reduce costs by utilizing the strengths of each mode of transportation while minimizing its weaknesses, and enabling shippers to reach more distant markets, reduce their transportation costs, and improve their overall supply chain performance.

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Збірка матеріалів  
XV Міжнародної науково-практичної конференції

**СУЧАСНІ ІНФОРМАЦІЙНІ  
ТА ІННОВАЦІЙНІ ТЕХНОЛОГІЇ  
НА ТРАНСПОРТІ**

**MINTT-2023**

Відповідальний за випуск *Врублевський Р. Є.*  
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Підписано до друку 19.05.2023. Формат 60x84/16.  
Папір офсетний. Друк цифровий. Гарнітура Times New Roman.  
Умов. друк. аркушів 22,5. Тираж 120 прим.

Херсонська державна морська академія  
Свідоцтво про державну реєстрацію ДК № 4319 від 10.05.2012  
73000, м. Херсон, пр. Ушакова, 20