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INFORMATION ARCHITECTURE CONCEPT MARITIME TRANSPORT LOGISTICS INFORMATION ARCHITECTURE IN CONDITIONS OF UNCERTAINTY

Introduction

The active development of world trade is characterized by the emergence of new forms of interaction – global transport systems and the emergence of global logistics initiatives. The process of globalization is characterized by high complexity and non-linearity of the configuration of logistics systems. Overcoming bottlenecks in transit requires expanding the foundations of the synthesis of the architecture of logistics schemes. The specifics of transportation require a constant exchange of information between remote points of cargo transportation, optimization of the loading of transport units and transportation routes, online tracking of goods throughout the entire route, and consistency in logistics chains. In 2024, the volume of the sea freight market was estimated at 381.69 billion US dollars. According to UNCTAD (United Nations Conference on Trade and Development) forecasts, in 2029 it will reach 471.81 billion US dollars, i.e., the average annual growth will be 4.33 %. Sea freight accounts for about 90 % of world trade. The prospects for the development of sea freight transport are determined by the increasing efficiency of shipping, increasing economic liberalization, increasing purchasing power parity, internet penetration, and the development of infrastructure and services. In addition, since online shopping is one of the most popular forms of trade worldwide, it simulates e-commerce in emerging markets.

Around 50 thousand ships trade worldwide. The world fleet is registered in 150 countries and is manned by seafarers of all nationalities. Trends in global container handling highlight the central role of the countries of the Asia-Pacific region, which is the fastest growing market. These countries have seen significant growth in intra-regional trade, reflecting fragmented manufacturing processes with final assembly elsewhere. The significant growth in the

movement of cargo flows is explained by the growing export potential of Australia and the USA. China, Japan, Singapore, and South Korea dominate the sea freight markets. At the same time, the uncertainty of the external environment is holding back, and sometimes leading to the collapse of, individual import and export trade networks, introducing a ban on the import of containers and ships from other countries. In addition, due to the uncertainty of changes in external and internal factors, according to UNCTAD, container ships spent 13.7 % more time in port last year compared to the previous year, which exacerbated delays and shortages.

Problem statement

The maritime transport market is concentrated. Maritime transport is a complex area due to the international nature of shipping and the global limitation of sulfur contained in carbon dioxide emissions in the form of environmental pollution. Changing external conditions that affect transport operations make it difficult for the industry to operate reliably and reliably, and bring to the forefront management in conditions of uncertainty.

Maritime transport logistics is focused on building the most profitable logistics chain for cargo transportation. Its advantages are the high availability of choice for building a route and the ability to deliver large consignments of goods. The use of sea transport logistics is the key to increasing the efficiency of the entire transport complex and activating its integration into the global transport system. This allows combining cost savings with flexible response to consumer priorities. At the same time, sea transport logistics has a strong dependence on the external environment in the form of correlations with weather conditions that reduce the speed of delivery, possible collisions with moving ferries, ships when passing through locks,

changing routes for accompanying cargo, etc. All this requires constant replenishment of input information and its various manifestations, as well as features hidden behind the abundance of poorly structured information. The basis for the implementation of such areas of development of transport logistics is information architecture.

The creation of a web resource for maritime transport logistics in conditions of uncertainty requires its own information architecture to simplify the search for the necessary information among large volumes of information. Despite the wide interest in the problem, the issues of the formation and design of the architecture of maritime logistics schemes have not been considered in depth enough.

Analysis of the latest achievements and publications

The international logistics platform of information architecture distributes information across countries with complex businesses and different data sources [1–4]. The architecture of the information service for the international multimodal corridor POL-Corridor is presented in [5]. In [6], a service-oriented architecture of data distribution and exchange in a heterogeneous environment is analyzed and designed. The information architecture for solving the problems of filtering, aggregation and operational analysis of downstream flows is presented in [7, 8]. A conceptual service-oriented program of information architecture with the interception of digital events related to transportation and monitoring of logistics processes with the presentation of interfaces is described in [9]. A method for operational information management on a route in the form of graph nodes describing stops between destinations, edges describing distances between routes and correspondence of implementations along several routes is presented in [10]. In [11], a search for collision-free paths for a set of agents based on neural structures is presented. In [12], a system architecture of intelligent transport logistics based on the collection and transmission of information for electronic coding in urban transport management is described. In [13], a functional model of the information architecture of the transport and logistics platform is presented. In [14], functional requirements for logistic distribution based on Internet of Things technologies are described. In [15], it is proposed to use the Node-RED programming tool for structured environments of the Internet of Things (IoT) system, using the same technologies and communication protocols to form a logistic apparatus. The forms of business logic, hierarchy of information and applications are defined. In [16, 17], an information architecture is

proposed that allows integrating information transported in containers into the logistics chain through an open interface platform that supports interaction with ports around the world. Despite the obvious advantages of using information architecture, information on its application in transport logistics is very limited. The unsolved parts of the general problem include the main forms and principles of organizing the content of the information architecture of transport logistics to simplify the search for information and orientation of existing resources.

The aim of the work is the concept of information architecture of maritime transport logistics in conditions of uncertainty

Work tasks:

- development of methods for organizing and placing content within a digital product
- structuring the search for available information on the information architecture of transport logistics
- specification, formation and meaningful interpretation of the principles of building information architecture

Presentation of the main material

Terminological interpretation of the category concept is a system of views on understanding phenomena and processes. In relation to logistics, this concept is transformed as a system of measures aimed at organizing economic activity by rationalizing the management of material flows. The task of logistics is to organize the movement of certain material objects. The task of transport logistics is to develop a route that will allow the cargo to be delivered in a short time with minimal costs. The task of maritime transport logistics is to plan, implement and manage the movement of goods through international waters and sea routes.

The information architecture of maritime transport logistics supports the functioning of the system throughout the entire life cycle of transportation. It consists of a set of related technical concepts and principles, united by functional and time parameters: port capacities, fleet and logical connections. The information architecture of maritime transport logistics can be recursively disassembled into parts interacting through interfaces.

When opening a search browser to form a request for the necessary information, it is necessary to organize the site well. However, even in this case, gigabytes of available information make it difficult, and sometimes impossible, to obtain specific information. When searching for information becomes too difficult, there is a risk that the user will abandon it. It is necessary to organize the information, structure it in advance and create the appropriate content of web resources that is convenient for the user. Content is the content of web pages, channels, various programs

and networks. This information fills communication channels, sites, landings, social networks. Content is text, graphics, videos, animation, images. In relation to the concept of information architecture of transport logistics, it represents information user content in SEO format. The search engine selects sites based on relevant content. The contact content of sites affects their ranking.

The basis of such content is information architecture.

Information architecture is not just the organization of content, but the creation of a logical structure that makes the site understandable and convenient for the user.

Information architecture is a science that studies how to place content inside a digital product by logically dividing paths, links and navigation on sites. Content is the reason why a user visits websites. Using information architecture, you can get a reference point in the available resources, i.e. the content

of their use and the search system. Logistical concepts of content management are expressed through the possibilities of information transfer: sequential, matrix and hierarchical.

The sequential scheme for studying content provides for its step-by-step consideration with the transfer of information to the next stage. The matrix scheme allows you to independently select a content category through the appropriate headings and various links. The matrix scheme is used on complex resources with gigabytes of information. Here you can cover and study all the content. A hierarchical or tree-like scheme organizes content: first, the user receives the most important basic information on the site, and then goes down to more detailed and clarifying information. There are four forms of content organization for building the concept of information architecture: an organization system, a tagging system, a navigation system, and a search system (Fig. 1).

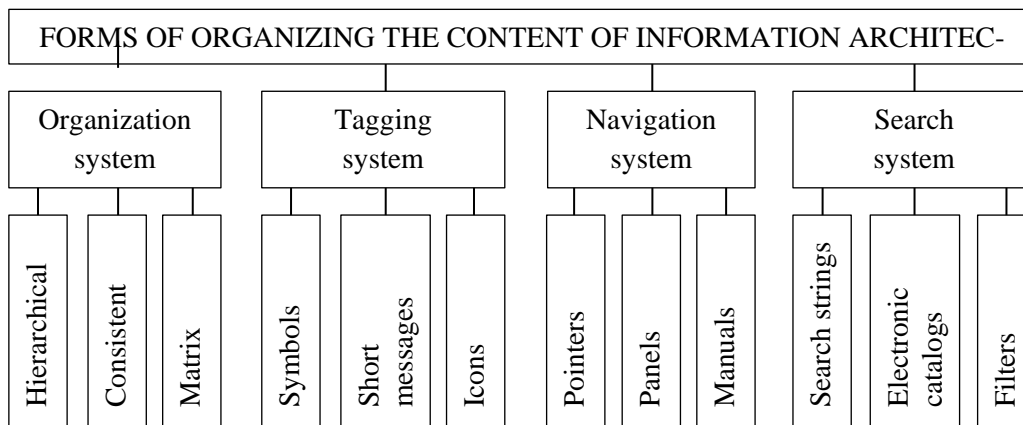


Fig. 1. Forms of organization of the content of information architecture

The main component is the content organization system. All the listed forms of content organization, expressed as logical management categories: hierarchical, sequential and matrix, act as independent components of information receipt.

If information becomes outdated, it is either deleted from the site, or updated, or some sections are regrouped, combining and adding facts and information. For this purpose, a tagging system is introduced.

The tagging system is a way of presenting large blocks of information in the form of symbols, short messages, icons. Using them, you can find the necessary information by associative pointers.

To move between different content groups, there is a set of actions and elements united by a common structural block – the navigation system. Navigation includes site maps, pointers, manuals, panels, links to pages. The search system in large volumes of data, electronic catalogs, filters is designed to find specific content on the site. The purpose of information architecture is to help users easily find useful information by organizing content with ordering of information and focus on practical use.

A flow chart of activities for creating an information architecture for transport logistics is shown in Fig. 2.

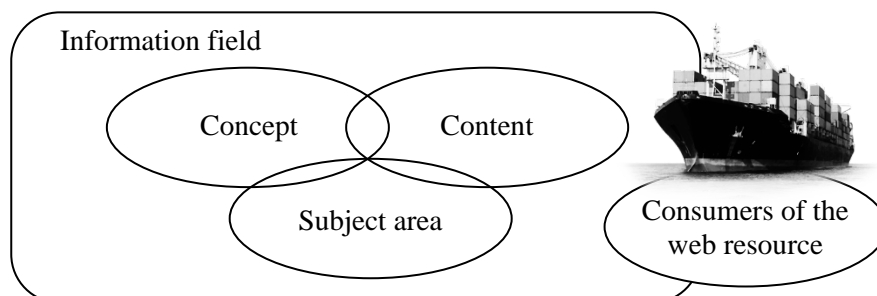


Fig. 2. Technology of creating information architecture

Technologically, the creation of information architecture begins with establishing the reasons for the creation and the circle of users of the web resource. Then comes the stage of developing a prototype of the future architecture, content scheme, links between elements and turning into visual layouts with a background, banners, text. The information architecture of each web resource is different.

The main requirements for creating the information architecture of marine transport systems are:

- integrity;
- efficiency and effectiveness;
- sustainability;
- adaptability to environmental impacts;
- openness;
- modularity.

The organizational principles of constructing the content of the information architecture of marine transport logistics in conditions of uncertainty of input information are presented in Table 1.

Table 1

Organizational principles for constructing the content of the information architecture of maritime transport logistics under conditions of uncertainty of input information

Principles of designing information architecture content	
Title	Meaningful interpretation
Lifecycle	Content has an evolving essence, which has its own life cycle, attributes and behavior
Category hierarchy	Instead of listing, a hierarchy of meaningful choice options is used
Revealing complex information	Explanation and disclosure of the essence of dynamic development from simple to complex aspects
Focusing on existing knowledge	Comparison with analogs and examples of use
Presenting accessible input information	Compression and accessibility of the text of primary input information on the site page
Variety of user behavior scenarios	Different scenarios of user behavior should be multiple: either wandering around the site or targeted search
Identifying the user and the site page	Identification of the user's location and the information navigation panel
Providing growth opportunities	Expansion of information when new information arrives

For efficient operation of maritime transport logistics built using information architecture, it is necessary to use a system for tracking and managing cargo delivery (TMS) at all stages of their movement, communication channels that ensure rapid exchange of information between process participants, and software. Optimization of logistics processes is carried out through the introduction of new information and communication technologies. Information and communication technologies are currently the main tools of the information space, with the help of which the modernization of the transport sector is carried out. Modern innovations in transport logistics concern GPS monitoring, virtual distributed cloud computing, Internet services. The implementation and practical use of the information obtained is based on conceptual models of system analysis with optimal coordination of cargo movement elements and adaptation to changing conditions. The functioning of maritime transport is characterized by situations of stochastic changes, ambiguity and uncertainty. The problem of accounting for uncertainty is associated with the influence of a large number of external factors depending on the specifics of transport: incorrect situation assessments, lack of reliable information, time constraints, untimely decision-making, etc.

Among the variety of types and kinds of uncertainty, the main ones are:

- uncertainty caused by lack of information and its reliability;
- uncertainty generated by too high or unaffordable payment for establishing certainty;
- uncertainty generated by the decision-making body due to its lack of experience and knowledge of factors affecting the objectivity of decision-making;
- uncertainty associated with time constraints and spatial elements to which the decision applies;
- uncertainty caused by the unpredictability of the external environment.

The task of the user of the information architecture is to find common features in the content array and form groups of information objects that should be taken into account when operating vehicles and carrying out transportation. Information architecture begins with a situational analysis. Based on the situational analysis, conceptual tools are defined as a single whole that determines the characteristic, purely individual preferences of users. The sequence of using the selected groups of information objects when building the information architecture is determined by the importance of the transportation objects under consideration. This is the essence of navigation priorities and concentration of efforts on their implementation at a given moment for a given situation.

Categorization of the content of transportation is determined by the needs of the user with subordination from the center in depth (Fig. 3).

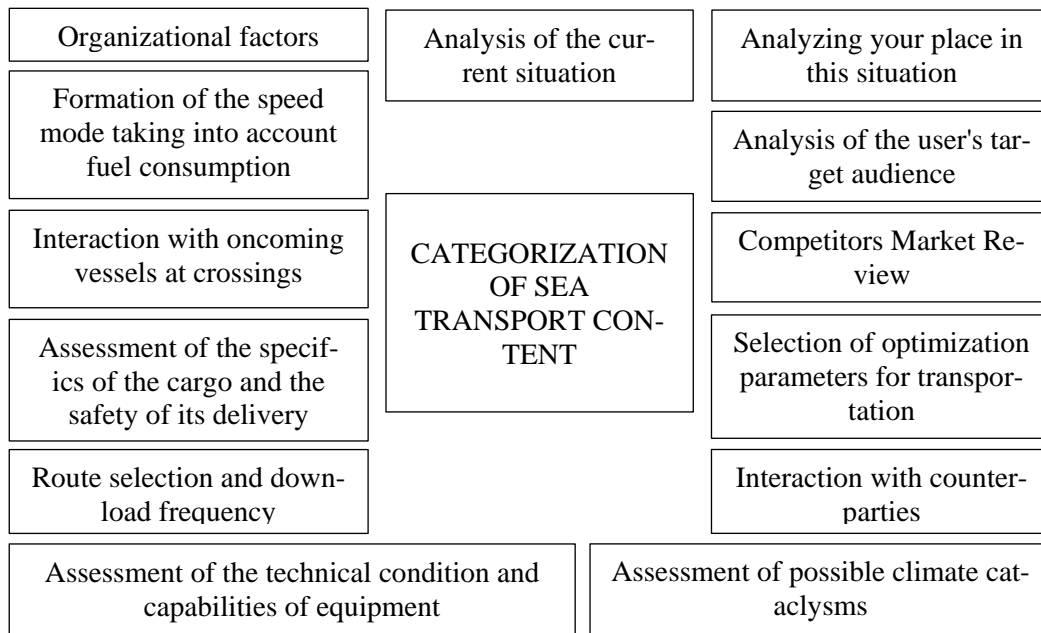


Fig. 3. Categorization of sea transport content

The use of the proposed methodology for searching for the necessary information in the entire variety of information about the situations that have arisen and possible management options in the form of reactions to the changes in transportation that have occurred and making optimal decisions can be presented in the practical activities of the merchant transport vessel FULDATAL, IMO 9962988 with a four-stroke main engine ABC (ANGO BELGIAN CORPORATION) with a capacity of 1104 kW. The information field was formed on the basis of a set of technical characteristics and operational parameters of the vessel, characteristics of the external environment, economic relations with contractors and organizers of transportation with reference to possible changes in weather conditions and the political situation in the international arena. The concept of ensuring transportation was determined by their target focus on delivering cargo in the shortest possible time with minimal costs. The content of the task contained the essence of the details and features of the transportation process and supporting information. When constructing the information architecture, information was organized, ranked and adapted to changing conditions. Information in the information architecture was structured according to its purpose and ensuring the functioning of the transport system throughout the entire transportation cycle.

Optimization parameters of sea transportation are: vessel loading, delivery duration, passage speed, route optimization, cargo specifics, weather conditions. Specific manifestations of these parameters for

the transportation of a merchant vessel will be the following moments of their use.

Vessel loading. For a vessel with a deadweight of 3804 tons, a reduction in the total tonnage of the transported cargo to 50 ... 70 % of the maximum value is allowed. At the same time, there are also smaller vessel loads. Thus, when moving from France to England with a cargo of shavings for kindling stoves and fireplaces, it was necessary to make calls at timber processing plants along rivers during loading. For a vessel 89.8 meters long, its draft was 5.4 meters. Compared to German and Italian vessels, whose draft reached 7 meters, this was an advantage.

Delivery duration. This parameter is determined by agreeing on the terms offered by the charter with the capabilities of the transport vessel, determined by the second mate or captain. Thus, for the passage from Italy to Greece, the charter offered five days. Taking into account the weather conditions and the difficulties of the passage, the captain estimated this at six days. After justifying the reasons for increasing the transportation period, the charter gave its consent. Although the technical conditions for operation provide for the maximum possible time in the ocean, determined through fuel and food reserves of 40 days, when determining the duration of delivery, economic considerations are used.

Transition speed. At low speed, fuel consumption is maximum. Thus, with a load of 75 % on the main engine, the maximum speed reaches 10 knots, which corresponds to a fuel consumption of 3.5 tons per day. Increasing the load on the main engine to 80 % leads to an increase in fuel consumption to values of

4.1 ... 4.2 tons per day, and the speed increases only to 11 knots. With a load on the main engine up to 95 %, fuel consumption will be more than 5.5 tons, and the speed increases to 12 ... 13 knots.

Route optimization and cargo specifics. There have been cases of transportation of fertilizers considered flammable cargo when in contact with fuel. Thus, during the transportation of such cargo with the passage from Poland to Israel, there was a delay of four days due to a forced call at the port of Barcelona. At the same time, there was an additional fuel consumption, which led to the need to pump fuel from dead reserves of tank engines with a volume of 1.5 tons with a list of the vessel to scoop out the strategic reserve.

Weather conditions. They are mainly associated with the seasons, headwinds and hurricanes. Thus, in the case of a tailwind with a load on the main engine of 50 %, a speed of 12 ... 13 knots is achieved.

A complex influence of these optimization parameters is also possible. Thus, when a vessel was not fully loaded while sailing from Israel to Turkey via the Bosphorus, the route was adjusted to Greece and Italy, where similar cargo ended up. In order to ensure full loading of the holds during the transportation of grain from the elevators of France in 3.8 thousand tons, in fact it turned out to be 2.5 thousand tons. The main cargo was delivered by calling at 4 ports along the rivers of France, which have the appropriate depth.

Organizational factors. An example of such deviations from the delivery times of goods was an increase in the planned parking during loading from two to three days due to the shipper's reasons. These factors also include equipment failures: the main engine, auxiliary mechanisms, turbine bearings, as well as unaccounted for and unpredictable factors. Thus, when passing the lock canals of the city of Kiel, the ship hit the lock, caught other ships, which caused a general delay of the caravan.

In the conditions of uncertainty of the influence of the external environment on the use of transport technologies, it is very important to obtain carefully planned, sufficient, user-friendly and truthful information about the changes and situations that occur, for which it is necessary to build an appropriate information architecture. Information architecture helps to take into account the user interests of consumers and serves as a means of facilitating the search for necessary information in the entire labyrinth of available information.

Conclusions

1. The structuring of the forms of organization of the content of the information architecture and the details of its components presented in the work can serve as the basis for the concept of the information

architecture of maritime transport logistics under uncertainty. A distinctive feature of the concept of the information architecture of maritime transport logistics is the development of technologies for using information resources when creating the architecture of maritime transport logistics based on the proposed classification of principles of construction and meaningful interpretation of elements.

2. Information architecture is a combination of models and tools for organizing content, marks, navigation and search in one information system. Such a structure ensures the unity of logistics solutions and their efficiency in maritime transport systems.

REFERENCES

- [1] Achkasova L.M. (2017) The place and role of transport logistics in the general logistics scheme. *Economics of the transport complex*, Vol. 30, pp. 77–86. URL: http://nbuv.gov.ua/UJRN/ektk_2017_30_10.
- [2] Khodoskina O. A., Anasovich V. D., Khilkevych A. I. (2019) The role of transport logistics in the activities of an industrial enterprise. *Bulletin of the Dnipropetrovsk National University of Railway Transport*, № 2(80), pp. 49–58 URL: http://nbuv.gov.ua/UJRN/vdnuzt_2019_2_7
- [3] Kirkin A. P., Kirkin V. I., Kirkina T. Yu. (2017) New analytical methods for managing transport flows based on systems research in logistics. *Bulletin of the Azov State Technical University. Series: Technical Sciences: Collection of Scientific Papers*. Вип. 34, pp. 209–216 URL: <https://doi.org/10.31498/2225-6733.34.2017.105930>
- [4] Sharko O., Buketov A., Klevtsov K., Saponov O., Akimov O. (2023) Modeling of transport and logistics schemes of freight transportation under global risks. *Problems of friction and wear*. №3 (100). 2023. С. 94–105. doi: [https://doi.org/10.18372/0370-2197.3\(100\).17899](https://doi.org/10.18372/0370-2197.3(100).17899)
- [5] Leviakangas P., Haajanen J., Alaruiikka A.-M. (2007) Information service architecture for international multimodal logistic corridor. *IEEE Transactions on Intelligent Transportation Systems*, 8 (4), pp. 565–574 doi:10.1109/TITS.2007.903049
- [6] Fan W., Gu J., Wang H., Cheng Z. (2012) Research of international logistics information platform based on soa. *CICTP 2012: Multimodal Transportation Systems – Convenient, Safe, Cost-Effective, Efficient - Proceedings of the 12th COTA International Conference of Transportation Professionals*, pp. 1965–1974. URL: <https://doi.org/10.1061/9780784412442.200>
- [7] Wang M., Wei Y., Huang X., Gao S. (2024) An End-to-End Deep Reinforcement Learning Framework for Electric Vehicle Routing Problem. *IEEE Internet of Things Journal*, 11 (20), pp. 33671–33682 doi: 10.1109/JIOT.2024.3432911

- [8] Buchmann A., Pfohl H.-Chr., Appel S., Freudenreich T., Frischbier S., Petrov I., Zuber C. (2011) Event-driven services: Integrating production, logistics and transportation. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 6568 LNCS, pp. 237–241 URL: https://link.springer.com/chapter/10.1007/978-3-642-19394-1_26
- [9] Baumgrass A., Cabanillas C., Di Ciccio C. (2015) A conceptual architecture for an event-based information aggregation engine in smart logistics. *Lecture Notes in Informatics (LNI), Proceedings – Series of the Gesellschaft für Informatik (GI)*, 248, pp. 109–123. URL: <http://www.getservice-project.eu/>
- [10] Ma X.-L., Zhao L.-D. (2007) Research on architecture of transportation monitor management system based on event driven theory. *2007 International Conference on Wireless Communications, Networking and Mobile Computing, WiCOM 2007*, art. no. 4341389, pp. 6570–6573 doi: 10.1109/WICOM.2007.1614
- [11] He C., Yang T., Duhan T., Wang Y., Sartoretti G. (2024) ALPHA: Attention-based Long-horizon Pathfinding in Highly-structured Areas. *Proceedings – IEEE International Conference on Robotics and Automation*, pp. 14576–14582. URL: <https://doi.org/10.48550/arXiv.2310.08350>
- [12] Liu F., Ning H., Yang H., Xu Z., Cong Y. (2006) RFID-based EPC system and information services in intelligent transportation system. *ITST 2006 – 2006 6th International Conference on ITS Telecommunications, Proceedings*, art. no. 4068521, pp. 26–28. doi: 10.1109/ITST.2006.288752
- [13] Wang H., Liu W. (2010) A study of the integrated transportation and logistics information platform of Yangtze River Delta. *2010 2nd Pacific-Asia Conference on Circuits, Communications and System, PACCS 2010*, 2, art. no. 5626592, pp. 190–193
- [14] Li L., Zheng Z. (2022) Construction of Logistics Distribution Information Sharing Platform Based on Internet of Things Technology. *Lecture Notes on Data Engineering and Communications Technologies*, 134, pp. 387–397. URL: https://doi.org/10.1007/978-3-031-04812-8_33
- [15] Sicari S., Rizzardi A., Coen-Portisini A. (2019) How to evaluate an Internet of Things system: Models, case studies, and real developments. *Software – Practice and Experience*, 49 (11), pp. 1663–1685. URL: <https://doi.org/10.1002/spe.2740>
- [16] Fahim P.B.M., An R., Rezaei J., Pang Y., Montreuil B., Tavasszy L. (2021) An information architecture to enable track-and-trace capability in Physical Internet ports. *Computers in Industry*, 129, art. no. 103443. DOI: 10.1016/j.compind.2021.103443
- [17] Xie C., Deng S.T. (2018) The Design and Implementation of Logistics Information System based of Multitier Architecture. *Journal of Physics: Conference Series*, 1087 (4), art. no. 042034. doi:10.1088/1742-6596/1087/4/042034

Шарко О. В., Мовчан П. В.

КОНЦЕПЦІЯ ІНФОРМАЦІЙНОЇ АРХІТЕКТУРИ МОРСЬКОЇ ТРАНСПОРТНОЇ ЛОГІСТИКИ В УМОВАХ НЕВИЗНАЧЕННОСТІ

На сучасному етапі розвитку морської транспортної логістики при організації міжнародних морських перевезень учасниками єдиного процесу, крім судновласників і вантажовідправників, стають банки, брокери, суднооператори, фрахтувальники, морські юристи та інші спеціалісти, які беруть участь у транспортному процесі. В цих умовах актуальною стає розробка концепції інформаційної архітектури морської транспортної логістики. Подано огляд світового ринку морських транспортних перевезень. Показано необхідність розробки засобів інформаційного забезпечення перевезень в умовах невизначеності впливу зовнішнього середовища. Представлено методологію організації та розміщення контенту всередині цифрового продукту інформаційної архітектури транспортної логістики в умовах невизначеності. Показано, що специфіка побудови інформаційної архітектури вимагає постійного поповнення вхідної інформації та її різноманітних проявів, прихованих за великою кількістю погано структурованої інформації. Представлено градацію та опис форм інноваційної архітектури, включаючи систему організації, систему тегування, систему навігації та систему пошуку. Встановлено, що технологічно створення інформаційної архітектури починається зі встановлення причин створення та кола споживачів веб-ресурсу. Далі йде етап розробки прототипу майбутньої архітектури, схеми контенту, зв'язків між елементами та трансформації у візуальні макети з фоном, банерами, текстом. Наведено організаційні принципи побудови змісту інформаційної архітектури логістики морського транспорту в умовах невизначеності вхідної інформації. Інформаційна архітектура допомагає враховувати інтереси користувача споживачів і слугує засобом полегшення пошуку необхідної інформації у всьому лабіринті доступної інформації.

Ключові слова: структуризація; інформаційна архітектура; морські перевезення; пошук; логістика; концепція.

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At the present stage of development of maritime transport logistics, when organizing international maritime transportation, in addition to ship owners and shippers, banks, brokers, ship operators, charterers, maritime lawyers and other specialists involved in the transportation process become participants in a single process. In these conditions, the development of the concept of information architecture of maritime transport logistics becomes relevant. An overview of the world market of maritime transport transportation is presented. The need to develop means of information support for transportation in the conditions of uncertainty of the influence of the external environment is shown. A methodology for organizing and placing content inside a digital product of the information architecture of transport logistics in conditions of uncertainty is presented. It is shown that the specifics of building information architecture require constant replenishment of input information and its various manifestations hidden behind a large amount of poorly structured information. A gradation and description of the forms of innovative architecture are presented, including an organization system, a tagging system, a navigation system, and a search system. It is established that technologically, the creation of information architecture begins with establishing the reasons for the creation and the circle of consumers of a web resource. Next comes the stage of developing a prototype of the future architecture, a content scheme, links between elements and transformation into visual layouts with a background, banners, text. The organizational principles of constructing the content of the information architecture of maritime transport logistics under conditions of uncertainty of input information are presented. Information architecture helps to take into account the user interests of consumers and serves as a means of facilitating the search for necessary information in the entire labyrinth of available information.

Key words: structuring; information architecture; sea transportation; search; logistics; concept.

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