ENSURING INNOVATIVE DEVELOPMENT OF THE MARINE TRANSPORT MANAGEMENT SYSTEM IN THE CONTEXT OF THE FORMATION OF THE GLOBAL DIGITAL ECONOMY

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Abstract: The article considers the peculiarities of the transformation of the freight transport management system in the conditions of digital economy formation. The integration of digital platforms into the management system of transport companies is designed to increase the overall efficiency of their activities. At the same time, it is objectively necessary to apply clear criteria for digitization of the maritime traffic management system. It is proved that the introduction of digital software solutions will allow transport companies to reduce their costs and increase the overall efficiency and profitability of their operation.

Keywords: Digital economy, Digital platforms, Maritime transport, Maritime transport companies.

1 Introduction

The transformation of the world economic system, which is under the influence of the intensification of information technology leads to the formation of a global digital economy in which the effectiveness of management decisions in many areas depends not only on the speed of response to changing market conditions but also on the quality and productivity and applications that are used to process data related to the internal and external environment of the enterprise.

At the same time, in the field of maritime logistics, such trends are quite intense, as the formation of global supply chains largely depends on planning not only the delivery route but also on the availability of free vessels of adequate capacity and free container capacity in the logistics network.

It should be noted that the supply chain planning system has long been based on the use of information technology at all stages of these business processes – from freight to insurance Lloyd's. However, the integration of all management information systems into one global digital supply chain management system can significantly increase the efficiency and speed of order fulfilment in the field of maritime transport by processing all data around the clock online using cognitive technologies of interaction with contractors.

Thus, the latest technologies and innovative digital software products can significantly increase the overall efficiency of maritime transport by optimizing all components of this business process and speeding up the exchange of information about it. The consequence of such digitalization is an overall increase in the profitability of companies operating in the field of maritime transport, as well as lead to increased investment in the integration of digital platforms in the activities of transport companies.

All this requires a significant update of data on the implementation of digital innovations in the management system, which requires additional research on their real effectiveness.

2 Literature Review

The study of the specifics of the organization of maritime traffic management is currently widely covered in specialized publications of leading scientists and practitioners. Of particular note is the contribution to the study of key principles of maritime traffic management by researchers such as O. Agres [1], B. Allate [2], B. Aleksyshyn [3], I. Balaniuk [5], O. Binert [7], Yu. Chaliuk [9], M. Dziamulych [11-16], O. Hamova [18], T. Lirn [19], H. Marchuk [20], M. Martinkovič [24], T. Shmatkovska [26-28], O. Stashchuk [32-34], V. Topalov [36], T. Tran [37], Ya. Yanyshyn [40], I. Zhurakovska [42]. In addition, it is necessary to note a number of studies related to the study of international maritime transport in terms of the need to improve their quality, which is set out in the works of scientists such as O. Apostolyuk [4], T. Beridze [6], A. Boiar [8], Yu. Drapailo [10], Z. Gontar [17], V. Marchuk [21-23], M. Postan [25], R. Sodoma [29-31], K. Stepanova [35], I. Yakoviyk [38], V. Yakubiv [39], O. Yatsukh [41] and many others.

However, it should be noted that with the intensification of the introduction of digital technologies in the process of shipping management at all stages, there is an objective need to rethink the principles of logistics and management of shipping. Thus, the current issues of effective organization of business processes in this area require additional practical research.

3 Materials and Methods

The theoretical foundation of the study was the methodology of project management, logistics theory, optimal management, games, as well as the work of leading scientists and specialists in the field of systems analysis, economic and mathematical modelling, operation, and management of freight.

The issue of transport process modelling and management is not new to economics and logistics management systems and has been considered by many researchers and designers. At the same time, different subsystems were distinguished according to organizational, functional features, and composition of elements. However, all the results obtained were not entirely based on systemic principles. This circumstance leads to the need to substantiate and formulate the system prerequisites for the design and the actual formation of the conceptual model of the maritime cargo management system. The design of such a model should be based on the following basic system-forming principles:

- Dialectical unity and interdependence of the system and the external environment;
- Structure and hierarchy;
- Integrity;
- Plurality of system description.

The concept of systematization involves the study of the problem of design as a system. Accordingly, the research methodology is a structured approach used by a team of managers to manage the process of developing digital solutions in the field of maritime transport. The approaches used in this case can be simple (formal and informal) or complex (groups of necessary modelling methods). In this study, the methodology is based on systems analysis and the theory of hierarchical multilevel systems.

4 Results and Discussion

As you know, sea freight is the most popular type of international transport service. Their key advantage is that they are suitable for the delivery of any goods and allow for high efficiency of the logistics chain. Practice shows that the current methods of transportation allow transporting both large

consignments of goods and single loads with maximum efficiency and economy. At the same time, the use of maritime transport communications, which have almost unlimited capacity and require less maintenance than other modes of transport, leads to a relatively lower cost of these shipments and results in a constant increase in their overall global volume.

In this aspect, it should also be noted that sea freight container transport is one of the promising sectors of the modern transport market. In particular, despite the challenges facing the industry in connection with the COVID-19 pandemic, the development of the global container market is characterized by a steady dynamic trend of increasing volumes of cargo transported by sea in containers. It is this growing demand for container transportation that requires the management of transport companies to find modern technical, technological, and organizational solutions to ensure their proper efficiency.

Of course, increasing the freight base is possible by attracting transit and increasing the overall transport attractiveness of companies, as freight flows usually face a number of bureaucratic obstacles and are complicated by the lack of a thorough tariff, which would include moving to the port and transport to the next point supplies.

The practice of forming a maritime traffic management system shows that it is a large and complex system. The first is determined by the fact that there is a significant number of elements and connections, the second – the heterogeneity of these elements and connections, the variety of their properties, and characteristics of selection. This is due to the structure and content of the objects to which the control of the system is directed – cargo and fleet. Therefore, when forming a management model of such a system, it must be considered in two aspects – morphological and functional, each of which, taking into account the characteristics of the object allows you to select the appropriate partial structure. In this case, the management system as a whole is formed on the basis of combining its subsystems. Thus, it can be argued that the internal synthesis of the system and elements of individual subsystems of maritime traffic management is realized through a set of models of their relationship.

The development of new approaches to forecasting maritime traffic should be based on the use of digital methods of exponential smoothing of time series through the use of software for big data processing online. This will allow obtaining data that will inform the management staff about changes in the structure of freight flows in the market, which in turn will allow:

- To conduct a rational tariff and freight policy in the region of the maritime transport company;
- To establish the ratio of transport capabilities of the fleet and the total potential volume of transport work;
- To distribute cargo flows between ports in accordance with effective market demand, as well as – to determine promising patterns of tonnage in accordance with the analysis of data on demand and assessment of its dynamics in the future.

The key advantage of using digital platforms in the maritime traffic management system is the lack of intermediaries in the process of forming agreements on the transportation of goods. In this way, digital economy technologies allow companies to eliminate unnecessary intermediaries or channels and create a more direct relationship between customers and transport companies. Accordingly, such a simplified ecosystem has less friction and lowers the entry barrier for players in the rest of the chain.

Thus, the concept of digital transformation of maritime transport has three main advantages relevant to this type of business: improving the efficiency of existing infrastructure; the emergence of qualitatively new business models; increasing revenue or reducing costs in existing business models. Accordingly, the digital transformation of maritime transport goes beyond the ICT industry itself, as its impact has affected the entire supply chain. In particular, we can consider the following three main areas in which new digital technologies can be used:

- The customer search, where transport companies can use digital information and social networks to attract their customers in new ways. For example, they can create digital user communities to add value;
- The operational processes, when digital technologies allow to achieve great results in operational activities at all stages of the supply chain;
- The business models, according to which the digital transformation allows developing completely new forms of creating and obtaining value in current business processes.

Thus, it can be argued that the consequences of the digital transformation in the business models of shipping companies are quite diverse. For example, digital technologies make it possible to reorient the boundaries of such companies to more global levels. General digital models of this business, as a rule, lead to a higher level of interaction between different participants. Such transport companies tend to compete on a larger scale than traditional shipping companies due to low geographical boundaries and resource needs to satisfy customers anywhere in the world. At the same time, as the cost of search and production communications has decreased significantly, the operating costs of digitalized companies are usually much lower than for traditional enterprises. However, it is also important to take into account the fact that Internet technologies increase the level of competition in the market and reduce entry barriers for competitors, which has the effect of increasing consumer influence in the process of concluding maritime transport agreements. As a result, companies that make extensive use of digital technologies stimulate the economic development of an environment that is often characterized by dynamic competition and high consumer surpluses.

Accordingly, the question arises about the specific areas of application of digital solutions in the management of maritime transport at the level of operating companies. In particular, one of the key tasks of a transport company's management is the processing of general cargo. An important aspect of this management is the interaction of companies with ports, the effective establishment of which allows them to quickly carry out loading and unloading operations on certain contractual terms. Therefore, building an effective model of economic and logistical relationships of transport companies with cargo owners and ports allows companies to optimize their own costs for cargo handling. The key principles of such optimization for companies are the following:

- It is expedient to direct cargo flows to certain ports in a proportion that reflects the ratio of levels of rates for cargo processing;
- The level of rates and the volume of freight flows determines the situation that is equilibrium, ie any change in one of the parties to the level of rates, provided that all others adhere to the same, should reduce the winnings of the party taking action.

Thus, the management decisions on the loading of ships require consideration of many operational and commercial, and legal conditions of the fleet, which is solved using digital models based on certain software solutions. However, the development of the models themselves to ensure effective management of maritime transport cannot be clearly formalized, as the capabilities of digital platforms provide a wide variety of models, which requires a specific approach to their construction. That is why in most cases to form an effective management model requires a rapid quantitative assessment of the possible consequences of production situations associated with the loading of both individual ships and groups of ships, solved by digital software solutions and applications in round-the-clock information processing online. However, the analysis and adjustment of decisions made on the basis of the implementation

of digital technologies in the process of maritime transport management will take into account the difficult formalized working conditions of maritime transport companies. That is why the greatest efficiency of integration of the management process with digital software solutions occurs with a wide range of goods transported by the company. There is also a need for intermediate aggregation of information on cargo flows to reduce the dimension of the overall task of optimizing the fleet. In this case, decisions regarding the loading of ships are made in the following sequence:

- Aggregation of information on cargo flows and determination on its basis of permissible options for loading tonnage;
- Optimization of decisions on fixing of specific vessels on routes and specification of their loading taking into account terms, sequence of approach in ports, and time of the readiness of cargoes for departure.

Thus, in order to ensure the effective solution of all tasks, as well as to ensure the transformation of the management system of maritime transport in transport companies from traditional to digital, it is necessary to go through two key stages of the transition to integrated digitalization of companies.

In the first, shipping companies set their own priorities for investing in digital projects. At the same time, a key element of such investment is a systematic understanding of where digital solutions can create the greatest value for an existing business model of a transport company, as well as what investments are needed and what should be the expected effect of implementation. The risks of changing the existing business model due to the introduction of new digital technologies in the maritime traffic management system are also subject to this assessment. At this stage, companies need to form a balanced portfolio of digital projects for the short and long term, as well as to form a system of monitoring and timely updating, according to their needs.

The second stage is to develop an effective digitization strategy, which should result in the structuring of efforts to move from traditional maritime and digital shipping management models. One of the key examples of such a strategy could be the use of blockchain technology in the management of maritime transport when it can greatly simplify the exchange of confidential data for different contractors or shippers. At the same time, transport companies themselves can create solutions for trade financing and supply chains to increase their efficiency and increase their own profitability. Therefore, the operation of such projects will lead to the successful use of the blockchain in the logistics of maritime freight.

5 Conclusion

Therefore, the formation of digital systems for the organization and management of cargo transportation processes by sea should be based on the methodology of project management, logistics theories, and systems analysis. At the same time, there is an objective need to integrate digital software solutions and models of organization and management of this transportation into the maritime freight management system. In the applied aspect, this means the need to build on the basis of digital platforms of dialogic decision-making systems that operate with the use of cognitive technologies and are aimed at solving the subject tasks for which the digital control system is designed.

Thus, it can be argued that after the process of transforming the maritime freight management system into a digital integrated platform, the transport company will be able to effectively solve simulation problems based on a simulation approach to ship loading in operational business management, optimize ship loading within existing supply chains, to optimize the distribution of cargo between vessels in the operational management of the company, as well as – to model the distribution of cargo flows based on the analysis of actions and decisions of all entities with which companies have to interact in the supply chain.

In general, it can be argued that the process of digitization of companies operating in the field of maritime freight will be individual for each of them. At the same time, the digitization process itself will differ both in approaches and time. However, it can be unequivocally stated that digital transformation is necessary and inevitable, which increases the requirements for the management of companies to quickly understand the feasibility and relevance of measures for the active introduction of digital technologies in their activities.

Literature:

1. Agres, O., Sadura, O., Shmatkovska, T. & Zelenko, S. (2020). Development and evaluation of efficiency of leasing activities in agricultural sector of Ukraine. *Scientific Papers: Series "Management, Economic Engineering in Agriculture and rural development"*, *20*(3), 53-60.
2. Allate, B.M. (2015). Shipping management and logistics innovation: key factors for success. *International Journal of Management Science and Business Administration*. 2(1), 50-55.
3. Aleksyshyn, B.G. (2002). *International and national safety standards seafaring*. Odesa: Latstar, 256.
4. Apostolyuk, O., Shmatkovska, T., Chykalo, I. & Husak, A. (2020). Assessment of the rural population economic activity in the system of united territorial communities development: a case study of Volyn Region, Ukraine. *Scientific Papers: Series "Management, Economic Engineering in Agriculture and rural development"*, *20*(3), 99-108.
5. Balaniuk, I., Kyrylenko, V., Chaliuk, Yu., Sheiko, Yu., Begun, S., & Diachenko, S. (2021). Cluster analysis of socio-economic development of rural areas and peasant farms in the system of formation of rural territorial communities: a case study of Volyn region, Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *21*(3), 177-188.
6. Beridze, T., Baranik, Z., Dashko, I., Hamova, O. & Tkachenko, S. (2021). Assessment of investment risks of an industrial enterprise. *Financial and credit activities: problems of theory and practice*, *5*(40), 429-436.
7. Binert, O., Sodoma, R., Sadovska, I., Begun, S., Shmatkovska, T. & Balash, L. (2021). Mechanisms for improving economic relations in the milk subcomplex of the agricultural sector: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*. *21*(2), 101-110.
8. Boiar, A. O., Shmatkovska, T. O. & Stashchuk, O. V. (2018). Towards the theory of supranational finance. *Cogent Business & Management*, *5*(1).
9. Chaliuk, Y., Dovhanyk, N., Kurbala, N., Komarova, K. & Kovalchuk, N. (2021). The digital economy in a global environment. *AD ALTA: Journal of Interdisciplinary Research*, *11*, Special issue XVII, 143-148.
10. Drapailo, Yu.Z. (2015). Legal regulation of relations in the field of transport in accordance with the Association Agreement between Ukraine and the European Union. *Law and Society*, *2*, 89.
11. Dziamulych, M., Moskovchuk, A., Vavdiiuk, N., Kovalchuk, N., Kulynych, M., & Naumenko, N. (2021). Analysis and economic and mathematical modeling in the process of forecasting the financial capacity of milk processing enterprises of the agro-industrial sector: a case study of Volyn region, Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *21*(1), 259-272.
12. Dziamulych, M., Sadovska, I., Shmatkovska, T., Nahirska, K., Nuzhna, O., & Gavryliuk, O. (2020). The study of the relationship between rural population spending on peasant households with the main socioeconomic indicators: a case study of Volyn region, Ukraine. *Scientific Papers: Series "Management, Economic Engineering in Agriculture and rural development"*, *20*(2), 217-222.
13. Dziamulych, M., Shmatkovska, T., Gordiichuk, A., Kupyra, M., & Korobchuk, T. (2020). Estimating peasant farms income

and the standard of living of a rural population based on multi-factorial econometric modeling: a case study of Ukraine. *Scientific Papers: Series "Management, Economic Engineering in Agriculture and rural development"*, *20*(1), 199-206.
14. Dziamulych, M., Shmatkovska, T., Petrukha, S., Zatsepina, N. Rogach, S., & Petrukha, N. (2021), Rural agritourism in the system of rural development: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *21*(3), 333-343.
15. Dziamulych M., Stashchuk O., Korobchuk, T., Mostovenko, N., Martyniuk, R., Strelkova, I., & Grebeniuk, N. (2021). Banking innovations and their influence on the formation of digital banking. *AD ALTA: Journal of Interdisciplinary Research, 11*, Special issue XVII, 108-112.
16. Dziamulych, M., Yakubiv, V., Shubala, I., Filiuk, D., & Korobchuk, L. (2020). Analysis and evaluation of the rural labour market and employment of the rural population: a case study of Volyn region, Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *20*(4), 165-174.
17. Gontar, Z., Marchuk, V., Durman, O., Denkovych, N., & Dudkevych, V. (2020). Exploring the Experience of the World's Leading Countries in Inclusive Growth as Part of the Post-Industrial Economy: Challenges and Perspectives. *Postmodern Openings*, *11*(2 Supl 1), 222-237.
18. Hamova, O., Dergach, A., Pikulyk, O., Ivanenko, O., Zolotykh, I., Diachenko, K. (2020). Methods of Regulating Migration Processes in EU Countries. *International journal of computer science and network security*, *21*(3), 257-265
19. Lirn, T.C., Lin, H.W., & Shang, K.C. (2014). Green shipping management capability and firm performance in the container shipping industry. *Maritime Policy & Management*, *41*(2), 159-175.
20. Marchuk, H., Prystai, G., Khorob, S., Marchuk, N., & Shoturma, N. (2021). The System of Media Critics in the Journalistic Environment in Postmodern Conditions. *Postmodern Openings*, *12*(1), 141-151.
21. Marchuk, V., Hladiy, V., Holubiak, N., Dudkevych, V., & Melnychuk, V. (2021). The Development of a System of Local Self-Government in the Countries of the Visegrad Group in the Conditions of Postmodern Society. *Postmodern Openings*, *12*(2), 233-245.
22. Marchuk, V., Novoselshyi, I., Melnychuk, V., Chorooyskyi, V., & Shlemkevych, T. (2020). The Appointment of the History Philosophy in Comprehending Modern Civilizational Challenges in a Post-Pandemic Society. *Postmodern Openings*, *11*(1Sup2), 74-84.
23. Marchuk, V., Pavlova, L., Ahafonova, H., Vonsovych, S., & Simonian, A. (2021). Communication Opportunities of Civil Society Institutions in Countering the Challenges of Post-Pandemic Postmodernity. *Postmodern Openings*, *12*(1Sup1), 335-345.
24. Martinkovič, M., Marchuk, V., Haydanka, Y., Kiyanka, I., & Vonsovych, S. (2021). Pedagogical and political concept of interaction of Ukraine and Visegrad Group. *Laplage in Journal*, *7*(3D), 159-166.
25. Postan, M.Y., & Balobanov, O.O. (2011). Method of Evaluation of Insurance Expediency of Stevedoring Company's Responsibility for Cargo Safety. *Methods and Algorithms in Navigation: Marine Navigation and Safety of Sea Transportation*, 33.
26. Shmatkovska, T., Dziamulych, M., Gordiichuk, A., Mostovenko, N., Chyzh, N., & Korobchuk, T. (2020). Trends in human capital formation and evaluation of the interconnection of socio-demographic processes in rural area: a case study of Volyn region, Ukraine. *Scientific Papers: Series "Management, Economic Engineering in Agriculture and rural development"*, *20*(2), 437-444.
27. Shmatkovska, T., Dziamulych, M., Yakubiv, V., Myshko, O., Stryzheus, L. & Yakubiv, R. (2020). Economic efficiency of land use by agricultural producers in the system of their non–current assets analysis: a case study of the agricultural sector of Ukraine. *Scientific Papers: Series "Management, Economic Engineering in Agriculture and rural development"*, *20*(3), 543-554.
28. Shmatkovska, T., Nikolaeva, A., Zabedyuk, M., Sheiko, Yu., & Grudzevych, Yu. (2020). Increasing the efficiency of the labour resources usage of agrosector enterprises in the system of sustainable development of the rural territories: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *20*(4), 467-476.
29. Sodoma, R., Brukh, O., Shmatkovska, T., Vavdiiuk, N., Bilochenko, A., Kupyra, M., & Berezhnytska, G. (2021). Financing of the agro-industrial complex in the context of the implementation of international experience. *Financial and credit activity: problems of theory and practice*, *38*(3), 341-350.
30. Sodoma, R., Cherevko, H., Krupiak, I., Andrusiak, H., Brodska, I., & Shmatkovska, T. (2021). Regulation of the lending market and prospects of financial sector stabilization in Ukraine. *Financial and credit activity-problems of theory and practice*, *36*(1), 4-13.
31. Sodoma, R., Shmatkovska, T., Dziamulych, M., Vavdiiuk, N., Kutsai, N., & Polishchuk, V. (2021). Economic efficiency of the land resource management by agricultural producers in the system of their non–current assets analysis: a case study of the agricultural sector. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *21*(2), 577-588.
32. Stashchuk, O., Boiar, A., Shmatkovska, T., Dziamulych, M., Skoruk, O., Tesliuk, S., & Zintso, Yu. (2021). Analysis of fiscal efficiency of taxation in the system of filling budget funds in Ukraine. *AD ALTA: Journal of interdisciplinary research*, *11*(1), Special Issue XVII, 47-51.
33. Stashchuk, O., Shmatkovska, T., Dziamulych, M., Kovalska, L., Talakh, T., & Havryliuk, O. (2021). Integrated assessment, analysis and management of financial security and stability of joint-stock companies operating in the agricultural sector: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *21*(2), 589-602.
34. Stashchuk, O., Shmatkovska, T., Dziamulych, M., Kupyra, M., Vahnovska, N., & Kosinskyi, P. (2021). Model for efficiency evaluation of financial security management of joint stock companies operating in the agricultural sector: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *21*(1), 715-728.
35. Stepanova, K.V., & Stepanov, V.M. (2017). Maritime State and Maritime Policy. *Economy and State*, *3*, 116.
36. Topalov, V. P., Torsky, V. G. (2008). Marketing and management in shipping (Basic concepts, elements and principles). Odesa: Astroprint, 84.
37. Tran, T.M.T., Yuen, K.F., Li, K.X., Balci, G., & Ma, F. (2020). A theory-driven identification and ranking of the critical success factors of sustainable shipping management. *Journal of Cleaner Production*, 243, 118401.
38. Yakoviyk, I., Chyzhov, D., Karpachova, N., Hlushchenko, S., & Chaliuk, Yu. (2020). National security policy in Ukraine: a change in the system of power relations of the modern world. *Revista San Gregorio*, *42*, 224-235.
39. Yakubiv, V., Boryshkevych, I., Piatnychuk, I., Iwaszczuk, N., & Iwaszczuk, A. (2020). Strategy for the Development of Bioenergy Based on Agriculture: Case for Ukraine. *International journal of renewable energy research*, 10(3), 1092-1102.
40. Yanyshyn, Ya., Sodoma, R., Markiv, G., Lipych, L., Shmatkovska, T., & Shidnytzka, G. (2020). Economic efficiency of the nuts complex business in the agriculture of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, *20*(2), 531-536.
41. Yatsukh, O., Demchenko, I., Ilnytskyy, D., Tsap, V., & Shmatkovska, T. (2021). Management of banking innovations in the conditions of digitalization. *AD ALTA: Journal of Interdisciplinary Research, 11*, Special issue XVII, 123-127.
42. Zhurakovska, I.V., Sydorenko, R.V., Shmatkovska, T.O., & Brodska, I.I. (2020). Factors of influence on employment in small and medium-sized business in Ukraine. *Financial and credit activity: problems of theory and practice*, *32*(1), 109-119.

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