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## ADAPTIVE MANAGEMENT APPROACH DEVELOPMENT OF SEA PORTS

### Abstract

*The article is devoted to the elaboration process of developing appropriate mechanisms to adapt management development seaports. Trends taking place in the system of national marine port infrastructure, actively cause effects on the complementary relationship between industrial and organizational management subsystems of units. This requires the creation of adaptive management of sea ports, given the specificity of the present stage of the national maritime industry.*

***The purpose of the article** is the development and implementation of an adaptive management approach to development, the use of which will increase the possibility of the enterprise promptly implement adaptive measures appropriate to the crisis of internal and external business environment.*

***Scientific novelty.** Researching the key purpose and directions of using an adaptive management approach to development of seaports, the following correspondence was identified:*

*- in case the phase of deep crisis of a seaport whose development status defined as insolvent, priority is given to the use of organizational and legal instruments, the purpose of which is to remove the seaport from the crisis and create conditions for its sustainable development;*

*- in case the actual status of the development of a seaport defined as satisfying, but prospects of its further functioning are unpredictable, the advantage is given to the use of technical and technological or management tools, the purpose of which is to restore the status of solvency of the seaport and to increase its level of competitiveness.*

*Technical and technological, management tools are also used in case the seaports being in a state of development, which is characterized as successful, in order to strengthen the market position of the enterprise in the maritime transport services market.*

***Conclusions.** Thus, according to the research we use the urgency adaptive approach to management of development of sea ports, and the direction of appropriate transformational changes using a specific set of tools. Based on the aforementioned dominant singled out the concept of «adaptive management approach seaport development» as a complex adaptive management measures aimed at the solution of two key issues, namely the survival port in terms of the crisis by implementing the necessary protective reactions; if need updating or improving the process of adapting the port in order to implement its development strategy.*

**Key words:** sea ports, strategic development, management, development, crisis conditions, renovation, adaptation.

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## **АДАПТИВНИЙ ПІДХІД ДО УПРАВЛІННЯ РОЗВИТКОМ МОРСЬКИХ ПОРТІВ**

### **Анотація**

Статтю присвячено опрацюванню процесу розробки відповідних механізмів адаптування системи управління розвитком морських портів. Тенденції, які відбуваються в системі розвитку вітчизняної морської портової інфраструктури, впливають на комплементарний зв'язок між виробничою та організаційною підсистемами управління її підрозділами. Це вимагає створення систем адаптивного управління діяльністю морських портів, враховуючи специфіку розвитку на сучасному етапі національної морської індустрії.

**Метою статті** є розробка та запровадження адаптивного підходу до управління розвитком морських портів, використання якого підвищить можливість підприємств своєчасно впроваджувати ефективні адаптивні заходи до кризових явищ зовнішнього та внутрішнього бізнес-оточення.

**Наукова новизна.** Дослідивши ключову ціль та напрямки використання адаптивного підходу до управління розвитком морських портів, визначено таку відповідність:

– за умов перебування у фазі глибокої кризи морського порту, стан розвитку якого визначається як неплатоспроможний, перевага надається використанню саме організаційно-правового інструментарію, ціль використання якого криється у виведенні морського порту з кризи та створенні умов для його сталого розвитку;

– за умов, коли фактичний стан розвитку морського порту характеризується, як задовільний, але при цьому перспектива його подальшого функціонування є непередбачуваною, перевага надається використанню саме техніко-технологічного чи управлінського інструментарію, ціллю використання яких є відновлення стану платоспроможності морського порту та підвищення рівня його конкурентоспроможності;

– техніко-технологічний та управлінський інструментарій також використовується у разі перебування морських портів у стані розвитку, який характеризується як успішний, з метою посилення ринкових позицій підприємства на ринку морських транспортних послуг.

**Висновки.** Відповідно до проведеного дослідження нами обґрунтовано актуальність застосування адаптивного підходу до управління розвитком морських портів, визначено

напрямки введення відповідних трансформаційних змін із використанням набору конкретного інструментарію. На основі означених домінант виокремлено концепт «адаптивний підхід до управління розвитком морського порту» як комплекс адаптивних заходів управління, орієнтованих на розв'язання двох ключових проблем: забезпечення виживання порту в умовах дії кризових явищ шляхом запровадження необхідних захисних реакцій; у разі потреби оновлення чи удосконалення процесу адаптації порту з метою забезпечення реалізації стратегії його розвитку.

**Ключові слова:** морські порти, стратегічний розвиток, управління, кризові стани, реновація, адаптація.

**Formulation of the problem.** The constant change of the competitive environment, as well as the influence of crisis phenomena, puts the need for the domestic enterprises, in particular seaports, to find new development approaches and activity management, as they become unable to make necessary adjustments in time to the developed strategy. In this regard, the problem of developing and implementing an adaptive management approach is getting more attention, that will increase the enterprise's ability to implement appropriate adaptive measures to the crisis phenomena of the external and internal business environment.

The adaptive approach as a whole determines that the enterprise as a single holistic system of development is constantly in the process of adaptation to the market conditions, and therefore it should continuously implement the corresponding transformational changes.

**Analysis of recent researches and publications.** The issues of development of the maritime industry in Ukraine were investigated by M. Maltsev, V. Miroshko, O. Merkt, O. Diachenko, I. Gryshova, O. Karpenko, G. Prodchenko, O. Nikoluk, V. Haustova, P. Marchuk and other authors [1–8]. In their point of view, the adaptive approach is characterized by situational and flexible features, which makes it possible to embody the adaptation measures not only into the activity of the enterprise, but also into the management system.

It should be noted that the adaptive approach is based on the use of the attribution «adaptation», the content of which is disclosed in a response to transformational changes in the conditions of development that will generate factors for reducing the efficiency of the enterprise development. Hence, the adaptive approach practically requires the systematic monitoring of the external conditions of the

enterprise development and, as a consequence, implementation of appropriate management directions to eliminate or minimize its negative impact on the implementation of the strategic priorities of the enterprise.

Today, it is rational to explore the adaptive approach by the following actions: as the adaptation process presented by the system of consecutive steps concerning to transformation of the economic potential of the enterprise in the areas of survival, maintaining the actual level of development and its growing; as a result of adaptation, rearranged such as enterprise development, which is already adapted to changes in the external business environment; as a result of the enterprise capacity building; as the ability to adapt, that is the ability of an enterprise to respond in a timely manner to any changes in market conditions or crisis phenomena [1].

**The purpose of the article.** Given the considerable relevance of the above, the purpose of the article is to investigate and to use an adaptive management approach to development of domestic seaports to remove them from a crisis that is already in place or is about to occur. At the same time, it is necessary to arrange such tasks as ensuring the efficiency of production, implementing the necessary transformational changes in port asset management.

The basis for determining the need to use an adaptive management approach to development of seaports should be their production area by type of provision of relevant services.

**Presenting the main material.** Based on our study on the attributes of «development», «management» and «adaptation» in the adaptive development of the enterprise, it is advisable to disclose the appearance of new or improvement of existing specific criteria for positive influence, the content of which is inextricably depends on

the action of the main and secondary factors of external business-centering for the development of an enterprise. Moreover, to regulate the influence of these factors and phenomena on the development of the enterprise at each stage of its management, it is worthwhile to improve the adaptive mechanism, where the main tasks are to justify, prepare and introduce effective development management scenarios of an enterprise, which are assigned to management and marketing.

The domestic management model was developed through the use of a certain set of industrial relations that historically have been formed within the development of the maritime ports system. With the development of the national economy, new forms and methods of industrial relations are gaining momentum, where the domestic management model is aimed at the transformation through the constant increase of the value of the private sector in the conditions of partial preservation of state property, first of all, in strategically important sectors of the national economy [2].

With regard to the development of domestic seaports, the process of management their development is quite often observed at the individual terminals of private companies, which is separate from the management of general marine processes, which include the implementation of the relevant functions of the state in the areas of creating and maintaining the necessary level of security for the development of seaports, targeted use of port charges etc. [3].

It should be noted that the need to implement measures of adaptive management of seaports activity is caused by a number of the following factors:

a) the imperfection of domestic legislation, which is primarily aimed at responding to international standards, provoked by the development of the global maritime network or as a result of the Convention regarding environmental support and safety, as well as the regulation of national factors;

b) the need to increase the competencies of the staff, to consider their social needs;

c) flexible tariffs for maritime transport services as a result of the challenges of domestic and international maritime trade conditions, which determine the volume of provision of relevant maritime transport services;

d) dynamic implementation of scientific and technical developments in the field of maritime transport services;

e) the influence of political and economic, hydrometeorological factors.

However, the adaptation process is also directly accompanied by the risks, that is why the adaptive management system must constantly apply new methods and tools of risk management in order to avoid or minimize negative impact of risks.

According to Ukrainian Law «On Seaports of Ukraine», within the seaport area there are economic entities of any legal form, whose activity is directly related to the service of vessels, passengers, cargo, and enterprises, products and / or raw materials which are transported through the shore and the water areas of the port [4].

The modern institutional conditions for the development of domestic seaports seek to find innovative methods to manage their activities, that is why the creation of a methodological platform for creating an adaptive structure to manage the development of seaports is gaining increased attention [5].

The purpose of this research is to work out a process for developing appropriate mechanisms for the management system adaptation for the development of seaports. Trends that are taking place in the system of national marine port infrastructure, cause effects on the complementary connection between the productive and organizational subsystems management of its departments. This requires the creation of adaptive management systems for seaports, taking into consideration actual specifics of development of the national maritime industry.

Within the management of the development of the seaport, different management systems performing functional responsibilities are formed, which should be divided into the following components: management levels; management level, are divided into sub-sections, departments, bureaus, etc., and horizontal and vertical links. Balance and equality is inherent in horizontal links, while vertical ones are characterized by a sign of subordination. The need for the implementation of vertical links is due to the existence of several management levels / steps, revealed by signs of hierarchy. It should be noted that

the development management system can be formal, informal, linear or functional [6].

One of the stages of creating a management system for the development of seaports is the separation of management subsystems, which presents the hierarchical relationships between them and interacting with each other, where the main function is to determine the organizational dimensions of the management subsystems, delimiting their functional responsibilities, the structure of communication support with other management subsystems and outline their tasks. It should be noted that the process of creating any control system is more universal by the nature. There are three main stages of its creation:

1) creation of a common management system;

2) elaboration of structural subsystems of management with description of the corresponding relations between them;

3) differentiation of functional responsibilities between management subsystems.

It should be noted that the system of management of seaports is formed and operates

depending on the specifics of the developed strategy of their development, the specifics of the development of their organizational and economic mechanisms and should meet the challenges of the external environment. Therefore, it should be adaptive to these changes, which are: matrix, design, targeting and network systems. Each system must be able to respond preventively and constructively to the challenges of the external environment by initiation the necessary security responses to ensure the implementation of a seaport development strategy [7].

The formation of an appropriate management system for the adaptive development of seaports should be focused on solving two key problems, namely: ensuring port survival under crisis conditions by introducing the necessary protective reactions; if necessary, update or improve the process of port adaptation in order to ensure the implementation of its development strategy. Basis the above problems, the following priorities of the adaptive management approach to development of seaports are determined (*Table 1*).

*Table 1*

***Directions in use of Adaptive Approach to Seaport Development Management***

№	Directions
1.	Creating economic entities capable to ensure effective development under the conditions of crisis phenomena and producing or providing high-quality products or services that meet market requirements
2.	Ensuring a solution in case development of the crisis situation
3.	Creation of structures capable to develop effectively in today's market conditions, while providing quality port services

*\* Developed by the authors*

The key goal and objective using the adaptive management approach to development of domestic seaports is to remove them from a crisis that is already in place or is about to occur. At the same time, it is necessary to arrange such tasks as ensuring the production efficiency, implementing the necessary transformational changes in port asset management [8].

The basis for determining the need to use an adaptive management approach to development of seaports should be their production direction by type of provision of appropriate services.

A number of tools for an adaptive management approach to development of

seaports, in accordance with the considered systematization of changing structures, include:

1) technical and technological tools, which usage provides the provision a such state of port development, at which the level of technical and technological equipment of its potential enables the enterprise to enter the market of maritime transport services with high quality products / services;

2) organizational and legal tools that provides structural transformation of the assets of the enterprise;

3) management tools designed to change the information platform, staff improvement or organizational structures of the seaport.

Examined the key objective and directions of using an adaptive management approach to development of seaports, let us determine the following:

- in case of a phase of deep crisis of a seaport whose development status is defined as insolvent, priority is given to the use of organizational and legal tools, where the main purpose is to remove the seaport from the crisis and create conditions for its sustainable development;

- when the actual status of the development of a seaport is characterized as satisfied, but the prospects of its further functioning are unpredictable, preference is given to the use of technical and technological or management tools, where the purpose is to restore the state of solvency of the seaport and to increase its level of competitiveness;

- technical and technological, managerial tools are also used in the case of finding seaports in a state of development, which is characterized as successful, in order to strengthen the market position of the enterprise in the market of maritime transport services.

It should be noted that the transformational changes of the relevant structures of the seaport will require the introduction of additional investment flows aimed at upgrading or innovation, introduction of modern technologies, activation of innovative opportunities [9].

Taking into account the innovative requirements and the ability to make effective decisions to enhance the innovative development opportunities of the seaport become the main platform to build new sustainable competitive advantages.

The implementation of any innovation process or innovative product / service will affect the performance of the seaport, namely: the level of production costs, the level of quality and the pricing policy of the products or services provided; rating of the seaport in the industry, its reputation; the level of activation of innovative opportunities; the level of port adaptability to crisis phenomena; degree of satisfaction of consumer needs and customers' requirements.

The process of seaport adaptation should be carried out in such a manner, to fully meet the requirements of the high-tech infrastructure of the seaport industry, the vectors of

industry development, as well as the level of competitiveness of maritime transport services.

However, the place and importance of the seaport as well as the methods of implementing adaptive measures and ways to achieve them should be taken into account while implementing the adaptation process and the directions of insertion of the appropriate transformational changes. This is possible by conducting research on the internal and external conditions for the development of the seaport.

The development of seaports through the implementation of adaptive approach measures can occur along many vectors, both sequentially and synchronously, however this is all determined by the current state of port development and the external environment. Moreover, the adaptation process can be considered as a means of overcoming the contradictions that arise both between the established development of the seaport and the market conditions.

The transformational changes that will come with the adaptation process can occur in the areas of reforming organizational methods, technical and technological update of the production process, improving the information platform, adapting the components of the potential subsystem to the modern development requirements, activating innovative processes at each stage of production.

The effectiveness of restructuring projects is expressed in increasing sales of products, increasing the competitiveness of products, rational use of resources, reducing production costs. By the nature of causality and reactions to external influences, distinguish between deterministic and probabilistic (stochastic) systems, which are characterized by different degrees of complexity. Distinctive features of complex systems are the hierarchy of construction, the diversity of structural and functional relations between system elements, the ramification of the information network, and intensive data flow [10].

Various structural and functional relationships in complex developing economic systems form their organizational and economic structure, which influences the results of the company. Organizational and economic structure is a hierarchical interconnection of a set of different interconnected «centers of responsibility», which include administration

and units that provide the implementation of goals and functions of management and production. In this case, the center of responsibility should be determined as a system object that ensures the completion of the complete production cycle in the field of management, production, supply, etc., and a distinctive feature of which is a fundamental ability to function independently, in isolation from a complex economic system and in the structure of any other similar system.

**Conclusions.** According to the conducted research, we have substantiated the relevance of applying an adaptive management approach to development of seaports, determined the directions of introducing appropriate transformational changes using a set of specific tools. On the basis of the identified dominants, the concept of «adaptive approach to seaport development management» was singled out as a set of adaptive management measures aimed at solving two key problems, namely: ensuring the survival of the seaport in crisis conditions by introducing the necessary protective reactions; if it is necessary to update or to improve the seaport adaptation process in order to ensure the implementation of its development strategy.

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