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FORESIGHT-TECHNOLOGY IN THE SYSTEM OF LOGISTICS MANAGEMENT OF THE ENTERPRISE

The essence of definitions of the concept "foresight" from the standpoint of foreign and domestic economists is explored. It is shown using of foresight technology and its tools make it possible to outline those areas of logistic activity of an enterprise that require an integrated approach to forecasting and prediction. The life cycle stages of situational forecasting process of the development of the logistics management system of the enterprise are formulated. The essence of situational forecasting is revealed, which is determined by the establishment of requirements for each work performed, which determines the requirements for subsequent work on the basis of certain and agreed parameters of their relations in such a market. Situational forecasting can be considered as one of the foresight technologies, based on structural analysis of tasks, which is formed in certain situations, with the subsequent establishment of an optimal system of procedures, methods and solutions for them is approved.

Key words: management decisions, foresight technology, logistic management, situational forecasting, life cycle.

Авраменко Е.В. ФОРСАЙТ-ТЕХНОЛОГИЯ В СИСТЕМЕ ЛОГИСТИЧЕСКОГО МЕНЕДЖМЕНТА ПРЕДПРИЯТИЯ

Исследовано содержание определений понятия «форсайт» с позиций зарубежных и отечественных экономистов. Показано, что применение форсайт-технологии и ее инструментария дает возможность очертить те направления логистической деятельности предприятия, которые требуют комплексного подхода к их прогнозированию и предвидению. Сформулированы этапы жизненного цикла процесса ситуативного прогнозирования развития системы логистического менеджмента предприятия. Раскрывается сущность ситуативного прогнозирования, которое определяется установлением требований к каждой проводимой работе, определяющих требования к последующим работам, на основании согласованных параметров их отношений на данном рынке. Утверждается, что ситуативное прогнозирование может рассматриваться как одно из направлений форсайт-технологии, базируемое на структурном анализе заданий, сформированных при определенных ситуациях, с последующим определением оптимальной системы процедур, методов и средств их решения.

Ключевые слова: управленческие решения, форсайт-технология, логистический менеджмент, ситуативное прогнозирование, жизненный цикл.

Авраменко О.В. ФОРСАЙТ-ТЕХНОЛОГІЯ У СИСТЕМІ ЛОГІСТИЧНОГО МЕНЕДЖМЕНТУ ПІДПРИЄМСТВА

Досліджено зміст визначень поняття «форсайт» з позицій зарубіжних і вітчизняних економістів. Показано, що застосування форсайт-технології і її інструментарію дає можливість окреслити ті напрями логістичної діяльності підприємства, які потребують комплексного підходу до їх прогнозування і передбачення. Запропоновано авторське бачення використання форсайт-технології у системі логістичного менеджменту, яке передбачає забезпечення можливості управління розвитком підприємства, його формування у реальному часі, виходячи із реальних логістичних ресурсів, умов і можливостей підприємства із урахуванням визначених цілей розвитку системи логістичного менеджменту. Сформульовано сутність ситуаційного прогнозування, яке визначається встановленням вимог до кожної виконуваної роботи, встановленням вимог до наступних робіт на основі погоджених параметрів їх відносин на цьому ринку. Стверджується, що ситуативне прогнозування може розглядатися як один із напрямів форсайт-технології, що базується на структурному аналізі ситуаційних завдань, сформованих при певних ситуаціях, з подальшим визначенням оптимальної системи процедур, методів і засобів їх вирішення. Визначені етапи життєвого циклу процесу ситуативного прогнозування розвитку системи логістичного менеджменту підприємства. Такий методичний підхід було апробовано при побудові дорожньої карти розвитку системи логістичного менеджменту автотранспортного підприємства. Така карта розглядається як елемент системи логістичного менеджменту, що дозволяє деталізувати окремі проблемні ситуації та формулювати завдання відносно їх вирішення. Вона передбачає чітке поетапне формування і безумовний послідовно-циклічний аналіз ситуацій прогнозування та їх узгодження із проектованими ситуаційними завданнями і відповідними процедурами їх вирішення. У роботі вперше представлені концептуальні положення застосування ситуативного прогнозування розвитку системи логістичного менеджменту підприємства, що базується на структурному аналізі ситуативних завдань при певних ситуацій з подальшим встановленням оптимальної системи процедур, методів і засобів їх вирішення.

Ключові слова: управлінські рішення, форсайт-технологія, логістичний менеджмент, ситуативне прогнозування, життєвий цикл.

Problem statement. Modern logistics, based on knowledge, information, and intelligence, is determined primarily by more rapid decision-making in the field of management and the rapid implementation of appropriate management activities. This requires accelerating the necessary conditions for the development of new technologies for economic forecasting and predicting the future development of the logistics management system in the sphere of production. It is foresight technology and its toolkit that allows you to highlight those areas of logistics activities of the company, require a comprehensive approach to their prediction and foresight.

Analysis of recent studies and publications. The theoretical basis of the research is the scientific work of domestic and foreign scientists in the field of man-

agement, forecasting, strategic management. The general issues of foresight technologies are dealt with by such scholars as L. Fedulova, T. Kvasha, V. Osipov, M. Bojkova, N. Gaponenko, A. Sokolov, A. Revenkova, B. Martin, R. Becker, M. Keenan and others.

Taking into account the integrational changes and trends of modern logistics, first of all, it is necessary to identify the possibilities of using new technologies of economic forecasting and predicting the future development of logistic management system in the sphere of production. At present, the issue of effective use of foresight technology in the logistics management system of the enterprise remains virtually unexplored, which, of course, reduces the possibilities for its dissemination.

The research purpose. The purpose of the research is to systematize and generalize the problems of the development of foresight technology and the possibilities of its use in the system of logistic management of the enterprise.

Statement of the basic material and key research findings. The urgency of solving the problems of effective adaptation of an enterprise to changes in the market environment is greatly increased in connection with the acceleration of the logistics cycle when the processes of analysis, calculation, design, production and sales of goods and services are combined. At the same time, it is important to develop and implement effective technologies for forecasting and predicting the passage of logistic processes capable of self-development in a certain time perspective. It must satisfy the following conditions:

to ensure effective development and implementation of the processes of logistic activity development taking into account the specifics of its functioning, global and national and regional trends, and the like;

Are allowed to carry out planning of necessary directions of logistical activity in coordination with short-term and long-term tasks of development of production structures;

to promote the growth of activity of logistic activity of the enterprise;

to reach consensus in choosing and implementing a scenario between all stakeholders involved in logistics activities;

to ensure the effectiveness of measures to release technology implemented.

As the analysis of the professional literature of such technology can be foresight technology, which B. Martin treats as follows:

This is the process of systematic assessment of long-term prospects for the development of science, technology, economics, and society with the aim of identifying new, breakthrough technologies, strategic orientations capable of maximizing the impact on the economy and society (1995) [11];

These are systematic attempts to assess the long-term prospects of science, technology, economics and society, so that strategically significant branches of scientific research and new technologies capable of bringing the greatest benefits (2002) [12].

Foresight technology ("brainstorming" involving experts from various fields of knowledge) developed by RAND Corporation (USA) in the 1950's. It founded the application in the '70s of XX century in the USA, Japan, and England, with the aim of predicting the future of the future and developing the best path of innovative technological development of the service sector [6]. Later in the '80s and '90s. XX century Foresight projects began to be implemented in France, Australia, Canada, and Sweden.

During the 90's. the practice of using foresight has significantly increased, and today foresight technology is seen as a powerful innovation and technology tool that has reached maturity: practically all developed countries of the world have considerable experience in this technology.

The most common interpretations of the concept of foresight are given in Table 1

In fact, the main problem with organizing forwards is "to bring together key agents of change and sources of knowledge in order to develop a strategic vision and supposed intellect" [12].

The common goals of the foresight include:

a) explore future opportunities in order to set priorities for investing in scientific and innovation-driven dynamism. Definition of "critical technologies". A more general perspective on prospects;

b) to reorient the socio-economic system of the country / region in order to establish a possible preliminary diagnosis of non-conformity of scientific and innovative systems with the needs of the country;

c) demonstrate the vitality of national scientific and innovation systems. Show the technological opportunities that they open for the country;

d) involve new actors in strategic discussions. The growing tendency to use foresight as a tool for expanding the circle of participants in the scientific and innovation policy;

e) to build new networks and links between the fields of knowledge, the sectors of industry and the markets. New networks and clusters that break through the old boundaries between disciplines and production sectors [14].

Obviously, it is expedient not to investigate any logistics management systems, but only those that are most effective for its development of the enterprise as a whole. At the same time, the principle of optimality of development, which involves the unification of scientific and technical, production, service processes in the market and interacting elements with them into a definite system and directing it to the expected final result, should be based on the prediction of the optimal composition and structure of such a system. This ensures the competitive advantages and progressive development of the enterprise in the context of accounting for the whole set of environmental factors that influence such development. It is necessary to highlight the most important of these factors:

1. A significant influence on the structure and structure of the system produces the factor of the unity of the purpose of its construction. Such a system arises in the conditions of formation and implementation of a set of internal and external economic relations at all stages of the life cycle of the process by integrating and adapting appropriately to changes in the external environment.

2. The formation of the structure of the logistics management system determines the ability of the enterprise to increase and maintain its share of the consumer market due to new product offers, target groups of consumers, regions of implementation of such a product. The ability of the company to maintain its leadership position thanks to vertical integration with suppliers and consumers is gaining momentum.

The internal and external production and economic ties, which are due to the production and logistics environment, acquire essential importance in the formation of the logistic management system. By direct influence on the state, they are unequal. The effectiveness of the system is determined primarily by these organizational and economic structures, determined by the densest

Table 1

The most common interpretation of the concept of "foresight"

Definition	Source
1	2
A systematic way of assessing those scientific and technological events that could have a strong impact on industrial competitiveness, the creation of wealth and quality of life	[10]
The process of active knowledge of the future and the creation of a vision of a medium-term and long-term perspective, is aimed at making topical decisions and mobilizing joint efforts.	[13]
The process of prediction, which includes advisory procedures to ensure the feedback between the external and internal environment of the object of research direction	[9]
The system of methods for expert assessment of strategic directions of socioeconomic and innovative development, identifying technological breakthroughs capable of effecting the impact on the economy and society in the medium and long-term prospects. A system of methods, a set of interconnected elements, separated from the medium and above and interacting with it, as a whole to achieve the goal	[8]
A specific technological development tool that focuses on the infrastructure that it creates within its framework. The assessment of possible scenarios for the development of specific areas of science and technology, outlines potential technological horizons	[3]
A special method of forecasting that differs from the usual method of forecasting by the fact that the future state of the object is not detected as a result of the forecast, but is established as a target	[5]
The process of vision of the future is constantly updated, taking into account the activity of the stakeholders involved in the area of its formation	[4]
A systematic, collaborative process for building a vision of the future, aimed at improving the quality of the decisions now made and accelerating joint action	[7]
The systematic, participative process of gathering information about the future and constructing a medium- and long-term vision, is aimed at prompt decision-making and the organization of joint actions.	[11]
The process, which involves intensive periods of a consistent approach to free reflection, networking, counseling, and discussion, leading to joint development of future visions and strategies of all stakeholders, in order to exploit long-term opportunities that are open to science, techniques and innovations in society. This is the opening of a common space for open reflection on the future and pursuit of strategic approaches.	[14]

interconnections and most influencing its development. In addition, one of the key conditions for the development of the logistics management system is the resource orientation, that is, the determination of the possibilities of combining the resources of all participants in logistics activities and their complex implementation is better and faster than that of competitors.

Thus, the foresight research center should be entrusted with a methodology for forecasting the development of a logistics management system that would allow in the medium and long-term to evaluate the limits of the output of goods and services depending on the efforts of the subjects of the market, the potential demand, demographic factors, the behavior of the external environment and other aspects of the sustainable development of the logistics management system of the enterprise. The conceptual basis of such a process should be the principles and methods of constructing a logistics management system in which the projected production of new products, their distribution, exchange and consumption are considered as organic unity. At the same time, it is necessary to keep in mind that such a process is an integral result of the aggregate relations of the participants and only in this sense can be most fully and properly investigated. Since the imitative analog of the process is involved in the prediction studies, methods of constructing such an analog play a great role for the forecasting effectiveness. It is important that the adopted simulation procedure reproduces as much as possible correctly the internal content of such relationships as basic when considering the essence and content of the development process of the logistics management system.

That is, the problem of solving the most critical tasks of the control of the forecasting process is to solve the problems that can arise in its separate units. The reasons for such contradictions are due primarily to the result of a certain "failure" under certain situations in the external and internal environment of the logistics management system [8]. This refers to the ability of the subject to effectively address the issues of the formation of managerial decisions, based on the awareness and analysis of the initial and predicted situation of market development, represented by a set of specific indicators. This approach is determined, first of all, by the ability to adequately "recognize" such a situation if:

the development or change of a situation, besides the meaningful actions of subjects of market relations, is affected by the state of the environment;

such events and conditions cannot be considered in full for any long period of time.

To perform the "recognition" of a given situation, an instrument such as modeling and calculating the state of the system and the probability of its change should be used.

Thus, efficient management of the forecasting process of logistics management system development should ensure not only the identification but also the elimination of certain problems that can seriously damage its functioning. At the same time, the implementation of a set of procedures, methods and means of their solution should be based on the establishment of concepts "situational forecasting" and "task of situational forecasting".

In the literal sense, the concept "situation" means a set of conditions and circumstances that create a definite position [1; 8]. In modern studies, the situation is defined as an economic category of management, since it reflects a combination of factors that influence the functioning of subjects of market relations. V. Vasilenko notes that the study of the situation in which the system is located and the conditions of the external environment of the managed object are an integral part of the acceptance and implementation of managerial decisions [1]. In this case, the scientist emphasizes the need for analysis of the initial information on the state of the object of research and the environment, as a reflection of the main features and trends of the situation under consideration. That is, in the description of situations arising in the process of forecasting, we

should take into account the information aspect, which in the most complete form reflects the degree of completeness and objectivity of changes in the actual state of the object of research.

In the plane of the investigated problem of the development of the logistic management system, the essence of situational forecasting is determined by the establishment of requirements for each business executed by the business, which determine the requirements for the following works based on certain and agreed parameters of their relations in such a market. Conceptually situational forecasting of logistics management system development is based on structural analysis of tasks, is formed under certain situations [8], followed by the establishment of an optimal system of procedures, methods and means of their solution (Table 2).

The main problem with the organization of foresight in the system of logistic management is to form a subject capable of:

implementing and combining thinking, communication and action [11]);

being collective and able to "bring together key agents of change and knowledge to develop a strategic vision and predictable intelligence" [12].

The main provisions of the situational forecasting of the development of the logistics management system of the enterprise include:

sequential-parallel coordination of activities related to the analysis of all organizational and technological issues of forecasting;

designing of expected intermediate and final results of forecasting;

development of the program of resource support for the forecasting process;

clarification, detailing of all elements of the forecasting process and their interconnections, which constitute its integrity;

determination of causes, incentives, positive and negative effects of solving the problem of prediction, material and moral losses when it is solved.

Thus, the situational forecasting of the development of the logistics management system of the enterprise is determined by a clear, gradual formation and distribution of organizational and managerial procedures for its business entities for the unconditionally sequential cyclical analysis of forecasting situations and their coordination with projected prediction tasks and corresponding measures of their solution.

The offered methodology was tested at construction of the road map of forecasting directions of development of the system of logistic management of the motor transport enterprise (Fig. 1).

Such a roadmap is an element of the logistics management system, which allows you to detail individual problem situations and formulate tasks to solve them. It provides for a clear, gradual formation and distribution of procedures of organizational and managerial character on its business entities in the uncontested sequential cyclical analysis of forecasting situations and their coordination with the projected prediction tasks and the appropriate modalities for their solution.

At the same time, as an obligatory requirement, the decision makers should be involved in the process of forecasting the development of logistics processes for the targeted one or another onsite technology.

Table 2

The life cycle of the process of situational forecasting of the development of the logistics management system of the enterprise

Phase	Phase content
1	2
Phase 1. Analysis of the situation at which the forecasting is carried out. Definition (statement) forecasting tasks	The analysis of the situation and the determination of its forecasting task is carried out. The necessity of carrying out external and internal forecasting, determined both by the external environment and the non-compliance of the adopted organizational and managerial decisions and the obtained results on the development of the logistic management system, is estimated.
Phase 2. Definition of structure and technology solutions of forecasting task	The structure (composition of material resources, means, methods and executors) and the technology of solving the situational task of the development of the logistic management system are determined.
Phase 3. Design of the forecasting results	The project of constructing a situational forecasting process for the development of the logistics management system forms an information basis for forecasting its strategic development.
Phase 4. Development of a program for achieving the results of forecasting	The program contains a complex of processes and types of work, with the help of which an algorithm for solving the prediction problem, provided by dedicated resources and executors, which use the available means of forecasting, is implemented.
Phase 5. Definition of structure and forecasting technologies	The formation, evaluation and coordination of planned decisions are carried out on the separate elements of situational forecasting of the development of the logistic management system.
Phase 6. Forming forecasting plan	A detailed specification of the model of the expected result of forecasting as the main element is carried out. The formation, evaluation and coordination of planned solutions for key logistic functions and each supporting function is carried out. Forecasting is directed to the development of a detailed specification of works that must be performed taking into account the existing and predicted state of the external and internal environment of the enterprise
Phase 7. Definition of information support technology for the forecasting process	Determine the necessary information support for forecasting, its structure and control technology in order to promptly display the state of development of the logistics management system, organization of monitoring, control and regulation of logistic processes
Phase 8. Implementation of the forecasting plan. Establish actual and projected deviations	Determine the actual and projected deviations from the decisions made. Determine the possible emergence of a new situation in the development of the logistics management system

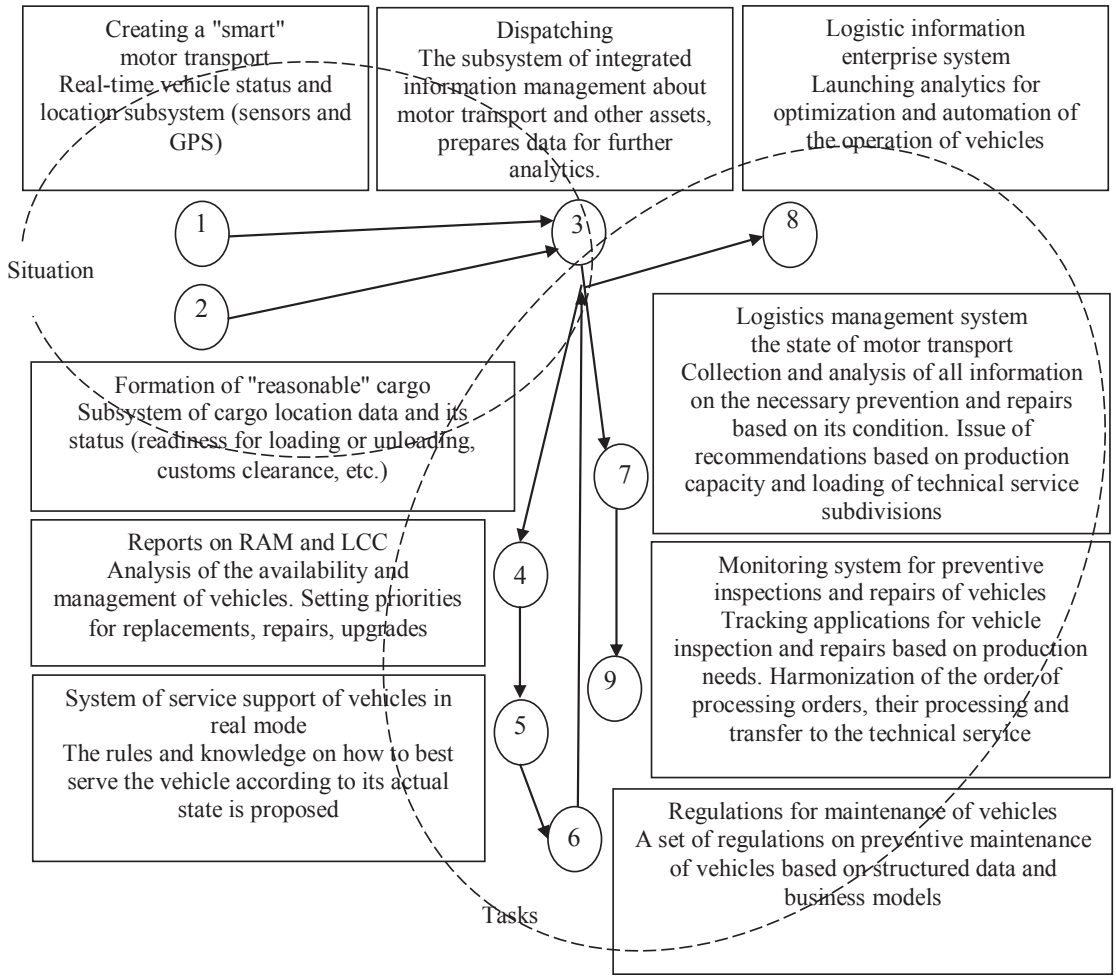

Fig. 1. An example of the construction of a roadmap for the development of the logistics management system of the motor transport enterprise

Conclusions. Implementation of foresight technology in the system of logistic management provides for the possibility of managing future development of enterprises, its formation in real time, based on existing logistics resources, conditions and capabilities of the enterprise (in the general approach of the potential of the enterprise), taking into account the certain goals of development of the system of logistic management. It is such a technology that can provide a significant effect in the transition to a sustainable development of the logistics management system of the enterprise, because it can only be achieved with a clear understanding of its essence by all economic entities and the awareness of the need for such prediction and prediction.

REFERENCES:

1. Василенко В.О., Шостак В.І., Клейменов О.М. Ситуаційний менеджмент : навчальний посібник. Київ : ЦНЛ, 2005. 372 с.
2. Калініна О.М. Реалізація функції цілеспрямованості в бюджетуванні з використанням форсайту. *Економіка та управління підприємствами машинобудівної галузі: проблеми теорії та практики.* 2013. № 1(21). С. 42–55.
3. Ковалева И.Н. Форсайт – фокусная основа устойчивого экономического развития региона в аспекте кластерной политики. *Сборник научных трудов «Проблемы современной науки»*. 2012. № 4. С. 132–139.
4. Козлов В.А., Третьяк В.П. Место теории слабых сигналов в технологии Форсайта. *Отраслевые рынки*. 2012. № 6–7(32). С. 1–17.
5. Михайлов К.В. Форсайт как метод прогнозирования. *Научные исследования. Серия «Общественные науки»*. 2010. № 1. URL: http://www.naukom.ru/journal/NU/mihaylov.php#-finref15 (access date: 20.12.2018).
6. Никитаев В.В. Форсайт как рефлексивное управление. *Рефлексивные процессы и управление*. 2011. Т. 11. № 1–2. С. 70–78.
7. Познанский В.И. Форсайт – важнейший инструмент инновационной экономики. *Теоретичні і практичні аспекти економіки та інтелектуальної власності*. 2012. Т. 1(2). С. 168–171.
8. Тридід О. М., Таньков К.М., Дутка Г.В. Система обслуговування споживача: теорія і практика : монографія. Київ : УБС НБУ, 2008. 184 с.
9. Becker P. Corporate Foresight in Europe: A First Overview. Luxembourg : Office for official Publications of the European Communities, 2003. 27 p.
10. Georghiou L. The UK Technology Foresight Programme. *Futures*. 1996. Vol. 28(4). P. 359–377.
11. A Practical guide to Regional Foresight / ed. by J.P. Gaviigan et al. URL: http://foresight.jrc.ec.europa.eu/documents/eur20128en.pdf (access date: 20.12.2018).
12. Martin B. Foresight in science and technology. *Technology analysis & strategic management.* 1995. Vol. 7. № 2. P. 139–168.
13. Martin B. Technology foresight in a rapidly globalizing. International Practice in Technology Foresight. Vienna : UNIDO. 2002. 14 p.
14. UNIDO technology Foresight Manual. Volume 1 : Organization and Methods. Vienna : UNIDO, 2005. 260 p.