

STABILIZATION OF LOGISTICS FUNCTIONS IN THE RISK MANAGEMENT OF REGIONAL LOGISTICS SYSTEMS ON THE PRINCIPLES OF THE INTERNATIONAL STANDARD

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Abstract

The issues of stabilization of logistics functions in the risk management of regional logistics systems are based on the principles of the international standard. Logistics functions are presented as special management functions.

The stages and components of the monitoring system of the logistics functions of the organization are identified. Attention is paid to the issues of stabilization of the logistics functions management system in accordance with the new requirements and conditions of the international standard ISO 9004:2018 series.

The article substantiates the procedure for diagnosing logistics functions as a means of self-assessment in the management of the organization and measuring the parameters of production and economic activity with the prospect of stabilizing the logistics functions «procurement» and «implementation», as well as risk management in regional logistics systems.

Keywords: international standard, logistics functions "procurement" and "implementation", stabilization, risk-management, monitoring, measurement.

СТАБИЛИЗАЦИЯ ЛОГИСТИЧЕСКИХ ФУНКЦИЙ В РИСК-МЕНЕДЖМЕНТЕ РЕГИОНАЛЬНЫХ ЛОГИСТИЧЕСКИХ СИСТЕМ НА ПРИНЦИПАХ МЕЖДУНАРОДНОГО СТАНДАРТА

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Реферат

Вопросы стабилизации логистических функций в риск-менеджменте региональных логистических систем опираются на принципы международного стандарта. Логистические функции представлены как специальные функции управления.

Выявлены этапы и составляющие системы мониторинга логистических функций организации. Внимание уделяется вопросам стабилизации системы управления логистическими функциями согласно новым требованиям и условиям международного стандарта серии ISO 9004:2018.

Обоснована процедура диагностики логистических функций как средство самооценки в управлении организации и измерения параметров производственно-хозяйственной деятельности с перспективой стабилизации логистических функций «закупки» и «реализация», а так же управления рисками в региональных логистических системах.

Ключевые слова: международный стандарт, логистические функции «закупки» и «реализация», стабилизация, риск-менеджмент, мониторинг, измерение.

Introduction

The paper suggests approaches to solving the problems of managing the sustainable development subjects of the regional logistics system. The practice of mastering the modern logistics concept is presented. The approaches that ensure the improvement of the risk management system in regional logistics systems are demonstrated based on the principles of the international standard. The tools that will provide a timely «targeted» response to changes in the business environment are presented. The proposed practice will allow for the stabilization of the logistics functions of the enterprise, which is associated with the loss of stability and risk management in regional logistics systems.

International quality management standards and the practice of mastering a new logistics concept

International standards of the quality management system form the principles of modern management. IS QMS is based on fundamental certification models:

- 1) ISO 9001 – Quality assurance model at the development stages (during production, design, installation and maintenance);
- 2) ISO 9002 – Quality assurance model at the production and installation stages;
- 3) ISO 9003 – Quality assurance model at the stage of control and testing of finished products.
- 4) ISO 9004 – 2008 «Management for achieving the sustainable success of the organization».
- 5) ISO 9004 – 2018 «Quality management. The quality of the organization. A guide to achieving the sustainable success of an organization».

Special attention is currently being paid to the ISO 9004 series. It regulates the management of sustainable socio-economic development (MSSED) of business entities. The management process is considered as the activity of management entities united in a system (line and functional managers, other management personnel); activities aimed at achieving the goals of the team and covering all eight special management functions (SMF):

- 1) organization policy;
- 2) human resource management;
- 3) production management;
- 4) marketing function;
- 5) *the implementation function* is assigned to sales managers;
- 6) *procurement function* – assigned to supply managers;
- 7) financial management;
- 8) the function of the quality management system (QMS).

The logistical aspect of management is to answer the question: «where it is more profitable to interact on business operations» - within the company or with the help of the market. The development of network structures in the interests of cooperation between suppliers and partners in the field of procurement and implementation creates innovative business models.

The authors formulate a view on the logistics functions of the organization as special management functions (SMF) «implementation» and «procurement». The processes of managing logistics functions involve work in two directions: 1) monitoring and evaluation of the sustainability of management in the field of «procurement» and 2) monitoring and evaluation of the sustainability of management in the field of «implementation».

Management of the sustainable development of a production organization covers eighteen management functions. They include: 1) special management functions (SMF), 2) common (general) management functions (CMF), SMF and CMF at three levels of management – strategic, current, operational.

For measurement purposes the level of manageability of logistics functions (LM LF), the authors applied the «Theory of measuring the manageability of economic activities of enterprises» by Professor O. A. Vysotsky. The LM LF measurement is performed simultaneously in the «procurement» and «implementation» areas. For this purpose, the main characteristics of the organization's management processes in the «starting conditions» are determined.

When conducting LF diagnostics, the authors use an *express analysis of the organizational structure* of management. The analysis allows to develop a program for managing the economic system and evaluate: 1) special and basic management functions; 2) the work of specialists who are responsible for the successful development of the enterprise; 3) the work of the functional and technical subsystem in the analyzed time period.

For the analysis, groups of experts are identified who should be interviewed in order to measure the special and common management functions of the organization (SMF and CMF). The content and stages of diagnostics of the logistics functions of the organization are presented in Table 1.

Table 1 – Stages of logistics management diagnostics and the content of work

Diagnostic directions	Content	Sources of information
Stage 1: Diagnostics of the control object		
OSM (organizational structure of the enterprise management)	Express analysis of the organizational structure of management based on the analysis of the staffing table. Analysis of the procedure for making managerial decisions in the field of logistics.	Information about the production and organizational structure of the enterprise; staffing table; expert survey.
Stage 2. Measurement of the overall management functions of the organization that form the management of sustainable development		
CMF (common management functions of the organization)	Preparation of the questionnaire. Measurement of the level of manageability by the main management functions in the field of logistics.	A survey of the organization's experts in the field of planning and control.
Stage 3. Measurement of the processes of managing the logistics functions of the organization		
L SMF (logistics special management functions)	Preparation of the questionnaire. Analysis of the level of development of special functions «Procurement» and «Implementation» in the organization's management processes.	Survey of the organization's experts in the field of logistics «Procurement» and «Implementation».
Stage 4. Determining the corrective effect for stabilization of the logistics functions «procurement» and «implementation»		
Dynamics of LM LF (the level of manageability of logistics functions)	Measurement of the level of manageability by the sustainable development of the LF. Determination of vectors of development forces for each LF for stabilization.	Analytical work: determination of the control zones of the LF.
Results: design of passports of the "Procurement", "Implementation" process and maps of procedures of related subprocesses		

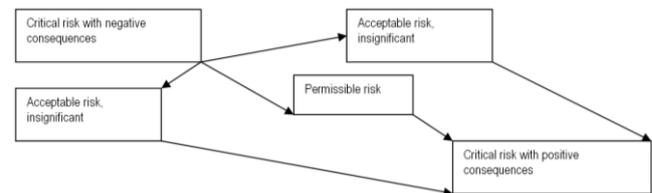
Source: personal development

This diagnosis is based on: a) analysis of the staffing table and functional responsibilities of logistics specialists; b) the theory of measuring the manageability of the economic activity of the organization by Professor O. A. Vysotsky; c) the feedback law and its role in management,

according to the MS QMS of the ISO 9004 series. This diagnosis allows to reduce the uncertainty of the business environment – to compensate for the negative impact in the field of risk management.

Risk management in regional logistics systems. Experimental implementation of the author's model of diagnostics of manageability of logistics functions in the regional system (Brest region)

Based on the conducted research, it was revealed that in the Brest region, as a transit region, the risks of providing logistics services «procurement» and «implementation» fell into the zone of critical risk with negative consequences. The level of controllability (LC) of the event is 16%, the probability of occurrence – 77%, the time of occurrence – 23%. This indicates a low degree of event manageability, a lack of time for decision-making. As a result, there is a high probability of a critical risk with negative consequences. The solution to this problem is prevention of risk, which contribute to the transition of a critical risk with negative consequences to an acceptable or permissible risk zone, or a critical risk with positive consequences (Drawing 1).



Drawing 1 – Possible ways of risk transfer

Source: personal development

According to the authors, a positive result in risk management in regional logistics systems (RLS) is achieved through increasing the level of event manageability. Diagnostics of management processes is necessary to stabilize management functions in the field of «procurement» and «implementation».

«Procurement» management is the first logistics subsystem that needs to be diagnosed. The measurement of the levels of «procurement» management was carried out by the authors through the assessment of the common management functions (CMF): 1) planning, 2) organization (decision-making), 3) motivation (stimulation), 4) control (monitoring), 5) accounting, 6) analysis (evaluation), 7) coordination (adjustment). This is a group of functions called the «Quality Loop».

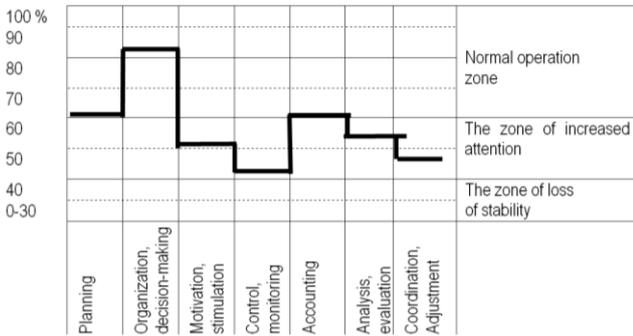
Six experts who know the procurement management processes and have their own performance assessments (their own opinion) were selected for the diagnosis. The experts worked with the questionnaire and evaluated the effectiveness of procurement management in the regional logistics system (radar) through the CMF on a 10-point scale. After filling out the questionnaires, the experts calculated the average scores for all indicators and determined the starting zones of manageability of «purchases» (table 2).

Table 2 – Processing of expert assessments and calculation of manageability levels by the logistics function «procurement» in the regional logistics system

Common management functions	Estimation in points										Definition LM, %	
	1	2	3	4	5	6	7	8	9	10		
1	2	3	4	5	6	7	8	9	10	11	12	
1. Planning LM 1					+	+++		++				65
2. Organization, decision-making LM 2							+	+	++			85
3. Motivation, stimulation LM 3			+	+	+	+	+	+				55
4. Control, monitoring LM 4					+	++	+	++				46
5. Accounting LM 5						+	++	++	+			65
6. Analysis and evaluation LM 6					+	+++						56
7. Coordination, correction LM 7					++	++	+					46
Generalizing level of manageability LM = (Σ LM1... LM7) / 7												59

Source: personal development based on the present data

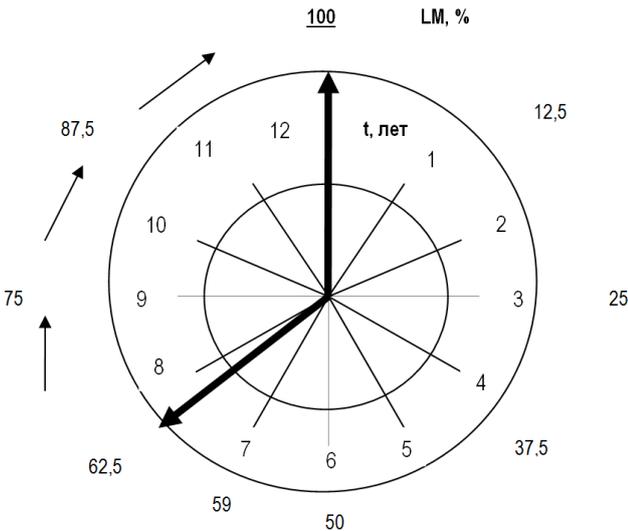
The level of manageability of the logistics function «procurement» in the regional logistics system of the Brest region is 59%. Based on Table 2, a schedule for determining the «procurement» manageability zones is compiled (Drawing 2).



Drawing 2 – Graph of controllability zones

At this stage of material flow management, it becomes necessary to make decisions on coordinating the interests of supplier and consumer enterprises. To do this, it is necessary to create a flexible system of centralized regulation and control.

The controlling and monitoring functions are close to the «loss of stability» zone and require stabilization. Next, the authors present the analytical tool «logistics barometer», it contributes to the removal of the OFU from the zone of increased attention to the zone of normal operation (Drawing 3).



Drawing 3 – Determination of the time of withdrawal of the main control functions from the zone of increased attention to the zone of normal operation

Source: personal development based on the present data

It is known that «procurement» is the process of movement of stock, materials, spare parts and components from the procurement market to the warehouses of the enterprise. «Procurement» management is the planning, organization and control of providing the main production with the necessary material and technical resources in a certain time mode with minimal total costs.

To calculate the time intervals of stabilization of each of the main functions: planning, organization and decision-making, motivation and stimulation, control and monitoring, accounting, analysis and evaluation, coordination, adjustment, we use the formula:

$$LM \Delta t = LM \Delta t_3 - LM \Delta t_0, \quad (1)$$

where, $LM \Delta t$ – interval indicator,
 $LM \Delta t_3$ – final indicator,
 $LM \Delta t_0$ – the indicator of the function in the starting conditions.

According to the general accounting system, the authors took a year as a unit of time, the period of stabilization of the main functions of the procurement department was 4,2 years.

According to the results of diagnostics, the average levels of controllability of each CMF at the initial stage differ. To know what forces to apply to the development of each function, the vectors of forces of development (VFD) were calculated CMF «procurement» (table 3).

Table 3 – VFD of the main functions of procurement management, %

Name of the indicator	Indications LM on t_0	Stage 1		Stage 2		Stage 3		Stage 4	
		LM (Δt_1)	LM (t_1)	LM (Δt_2)	LM (t_2)	LM (Δt_3)	LM (t_3)	LM (Δt_4)	LM (t_4)
1. Planning	46	3	4	5	6	7	8	9	10
2. Organization, decision-making	65	8,75	73,75	8,75	82,5	8,75	91,25	8,75	100
3. Motivation, stimulation	46	13,5	59,5	13,5	73	13,5	86,5	13,5	100
4. Control, monitoring	85	3,75	88,75	3,75	92,5	3,75	96,25	3,75	100
5. Accounting	55	11,25	66,25	11,25	77,5	11,25	88,75	11,25	100
6. Analysis and evaluation	65	8,75	73,75	8,75	82,5	8,75	91,25	8,75	100
7. Coordination, adjustment	56	11	67	11	78	11	89	11	100

Source: personal development based on the present data

Management of «implementation» is the final function of logistics, it aims to form an optimal logistics distribution network. This requires close interaction of related services with each other: marketing, sales, procurement and finance services.

To measure the levels of «implementation» management in the logistics system (Brest Region), a similar work was carried out: based on expert assessments, the levels of manageability of general distribution management functions in the regional logistics system were calculated; the initial distribution manageability zones in the regional logistics system were determined.

As a result, it was revealed: the largest amount of work needs to be carried out regarding the main functions in the field of «procurement»: 1) planning, 2) motivation and stimulation, 3) accounting – it is necessary to provide an increase of 50 %. The use of vectors of development forces for 4 years will increase the controllability levels of all OFU LF to 100 % – the zone of normal operation mode. Thus, due to the proper performance of the main functions in the field of «procurement» and «implementation», the logistics functions of the regional logistics system are stabilized.

Conclusion

The conclusions and recommendations made based on the results of the study will allow the subjects of regional logistics systems to increase the efficiency of logistics activities. Tools for managing the level of socio-economic development (LM SE) of subjects (RLS) in the field of logistics are proposed.

The theoretical significance of the research results lies in the fact that the conclusions and recommendations are aimed at solving the scientific problem – determination of methods of analysis and measurement of logistics function management processes. They expand the understanding of the need to assess the level of risk management in logistics systems as an indicator of their effectiveness and as a tool for tracking the dynamics of system development.

The authors draw attention to the need to follow the principles of achieving sustainable success in the field of logistics, according to the ISO 9000 QMS: identify short-term (from a month) and long-term (up to 5 years) risks associated with the organization's activities and form a general strategy for reducing them; provide an opportunity for managers and employees of the organization to «learn lessons» and exchange experience to maintain the viability of the organization; develop and maintain processes of innovation and improvement of methods of sustainable risk management in regional logistics systems in a workable state.

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