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KEY ASPECTS OF LOGISTICS SERVICES AUDIT

The article deals with logistic audit essence and its value, with main stages of logistic service audit and informational support at these stages. Also author characterizes in details behavior model concerning logistic service factors analysis, which includes trimeric decision making matrix.

Keywords: logistics, logistical service, logistics services audit, logistical audit, trimetric matrix.

Problem statement. Under modern conditions of the economy development and high level of competition the native enterprises can hardly keep sales stable level or stimulate their increasing dynamic. Their economic environment creates many risks and dangers, the reveal and foreseeing of which is significant task in enterprise activity. The risks are caused either general macroeconomic situation in the country, or in-sectoral factors: new competitors, new product issue or service, existing contractors' bankruptcy risk etc. Such situation has to transfer more attention of the administrative part at the enterprise for analysis of the internal problems.

The statistics shows that logistic expenses are 30% from price of good at the native enterprises, at the same time in Germany the given factor is about 10%, and in Great Britain – 8% [15]. Thus, the Ukrainian enterprises have cost saving reserve in distribution lines, the main instrument of which is logistics audit. Taking into account the fact that logistics expenses cost lower than in the above mentioned countries, we suppose that logistics processes optimization can have positive result both in production profitability sphere and in the logistics service providing quality increase for clients. It may be expressed in supply terms decrease, which is lower than final cost of the product or service for them and in fastening and simplicity of the logistic processes through refusal of inefficient components or through innovative activity results involving etc.

Analysis of the recent research and publications. Study of the logistics audit problems is important direction for scientific investigations of the native and foreign scientists. Particularly, general problems of the logistics audit and logistics service audit (LS) as its constituent are shown in works of the following native and foreign scientists J.R. Stock and D.M. Lambert [21], R.R. Larina [15], P.R. Levkovets [16], L.Yu. Mykhalchuk and O.A. Melnychuk [17], M.A. Oklander [19], N.I. Chukhray and O.B. Girna [4], T.V. Sharchuck [20] and others.

On the other hand, problems of the enterprise activity logistic providing, which are ground for logistic service, are in the center of the following Ukrainian scientists' attention: Kh.M. Bespalyuk [1], O.A. Bilovodska [2], S.V. Garmash [8], Ye.V. Krykavsky and T.V. Nakonechna [11], O.Ye. Kuzmin [12] etc. These and those scientists' works are significant grounds for further investigations, but some questions need to be analyzed and studied in more details.

Object of the article is to characterize the logistics audit essence, to form main stages of

the logistic service audit and to observe informational providing of these stages, to characterize behavior model concerning logistic service factors analysis.

Main material. The efficient instrument to analyze and to control enterprise activity is the logistic audit, conducted though involving of the logistics specialists-auditors into the real operations practice. It provides great decrease of distance between logistic function objective estimation in the company getting, investigation of the recommendations and innovations introduction [20]. Thus, the role of the logistic audit consists in that fact that [9]:

- it allows to evaluate efficiency of the marketing logistics system functioning at the enterprise;
- it provides to reveal possibilities to optimize logistic business-processes of the marketing logistics;
- it reveals sources of the logistic expenses in key and main marketing logistics business-processes;
- it allows to investigate plan to optimize logistic business-processes;
- it systematizes the control of enterprise marketing logistics system;
- it allows to evaluate level of the competitiveness concerning enterprises supply lines, using benchmarking methodology.

Data of the checking subjects' business accounting, finance and statistic reporting are bases to conduct audit. Special documents, logistic management staff, periodical reports and other things are used to carry out audit checking [14].

Logistic service audit is a component of the general logistic audit, main task of which is logistics right positioning in general structure at the enterprise, comparison of the logistic targets and strategies with market subject global strategies [17]. Logistic service audit represents sources of the spare logistic expenses and investigates plan for further actions concerning development or withdrawal of the logistic service components in order to find optimal ratio between its level and proper expenses. Thus, logistic service audit is reasonably conducted by stages, shown in the Fig. 1.

The first stage consists in the existing quality service standards check, collection and processing of information, necessary to calculate logistic service estimation factors. These factors are observed in details in author's another works [6; 7]. Data for their calculation are in enterprise internal reporting, including both specially formed factors and general statistics, which may be used to conduct logistic service objective evaluation. Other sources can include conclusions of the specialized experts in logistics sphere, involved to analyze logistic service at the enterprise. The general documents with information concerning logistic service efficiency include general estimation of the enterprise efficiency, contractors' analytics concerning terms for logistic service price, market investigation etc.

The second stage is to estimate logistic service real state, where due to the data, collected at the previous stage, the estimation is conducted and all factors significance are defined. It is reasonably to use method of the expert estimations. But one has to remember that only clients may objectively evaluate service level, that's why it is necessary to keep contact constantly with them, using all possible connection channels. Such channels include either interviewing through questionnaire, target phone calls, other ways to receive regrets and proposals, or through information collection, analyzing social nets, specialized forums, if it concerns clients' service, or analysis of the economy activity factors dynamics, if it concerns corporative sector.

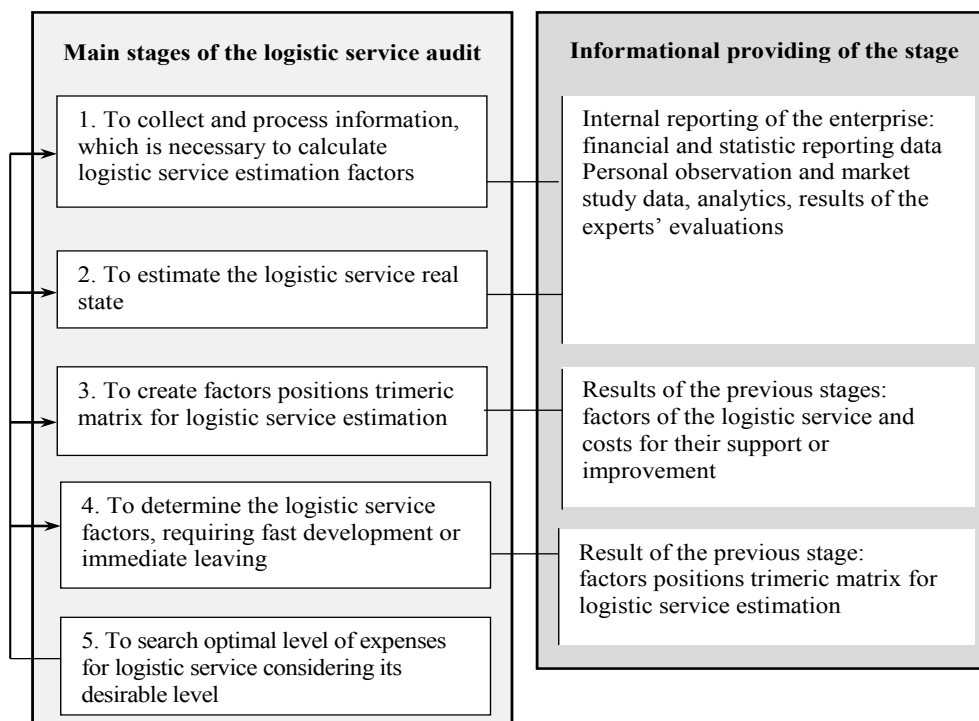


Figure 1 – Main stages of the logistic service audit, (authors' personal study based on [4; 15])

Information, received at this stage, becomes base to estimate logistic service efficiency and allows to investigate proposals concerning process optimization, which will better require clients' demands.

After estimation matrix of decisions making is created concerning logistic service factors that is *the third stage* in audit. All factors are located by three axes:

- logistic service element of the estimation factor weight (it takes the value 0-1);
- estimation of the logistic service element (it takes value 0-1);
- costs for support or improvement of the logistic service element estimation factor (element, which has the biggest expenses are counted as base – 1, and all other expenses are calculated rationally, i.e. all expenses may take value 0-1 – formula 1):

$$F_e = \frac{E_i}{E_{max}}, \quad (1)$$

where F_e – is factor of expenses for support or improvement of the proper logistic service element estimation factor; E_i – expenses for support or improvement of i -factor ($i = 1, 2, \dots, 22$) concerning logistic service element estimation; E_{max} – the expenses largest value for support or improvement of the logistic service element estimation.

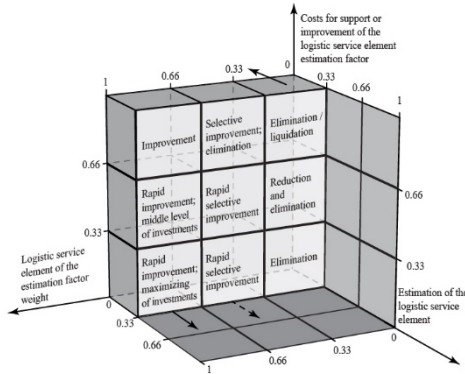


Figure 2.1 – Matrix of decision on indicators with low values (0-0,33]

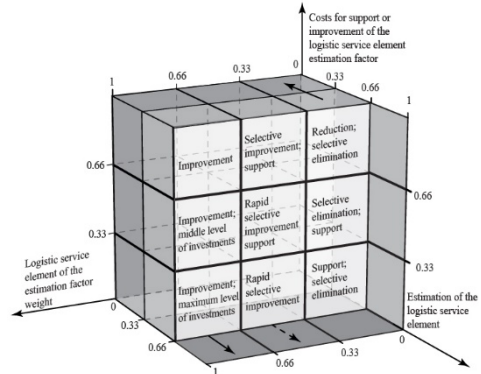


Figure 2.2 – Matrix of decision on indicators with average values (0,33-0,66]

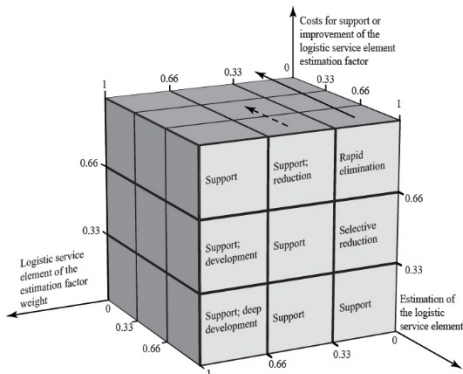


Figure 2.3 – Matrix of decision on indicators with high values (0,66-1]

Notation conventions:

→ direction of movement corresponding to the square

---→ direction partial transfer of appropriate box

Taking into account the fact that all factors, which are necessary for matrix, take value 0-1, each of matrix measuring is divided into three parts (0-0,33; 0,34-0,66; 0,67-1).

The fourth stage is to define factors of the logistic service, which require fast development or immediate leaving. It means that received matrix provides to form detailed program of actions concerning each logistic service element, to determine priorities for every points, and to make a list of the immediate actions, necessary for drawbacks removal or even to refuse inefficient constituents of the logistic service.

Thus, matrix has 27 quadrants (fig. 2.1-2.3), which can be figuratively divided into three generalized categories (coordinates are pointed in the following consequence: weight; estimation; expenses):

- 1) perspective elements of the logistic service (0,67-1; 0-1; 0-1);
- 2) neutral elements of the logistic service (0,34-0,66; 0-1; 0-1);
- 3) weak elements of the logistic service (0-0,33; 0-1; 0-1).

Detailed characteristic of elements groups and their development models are presented in Table 1.

Table 1 – Specification of the decision making matrix concerning logistic service elements

Type of the matrix category	Weight of the LS element estimation factor	Factor of expenses for support or improvement of the LS element estimation factor	Specification of the elements group	Model of the elements group development
Perspective LS elements	(0,66-1]	(0-0,33]	Highly perspective LS elements, because their weight is significant, and expenses for development or support – are minimal. That’s why investing and elements values rise play important role, which are in quadrants (0 – 0,66], and also elements support in quadrant (0,66 – 1], because just they may be significant competitive advantages	Profound development, investments priority
		(0,33-0,66]	Level of the LS elements perspectiveness is high, because in previous case elements weight is high, and expenses for their support or development are average. Thus, it is necessary to improve LS elements estimations, but at the same time investments priority level is lower than that in the previous group	Improvement, investments average priority
		(0,66-1]	LS elements are perspective, but have lower priority that previous ones. These elements have high weight for consumer, but expenses for their development are also high	Improvement and support
Neutral LS elements	(0,33-0,66]	(0-0,33]	Weight of the proper LS elements is average, and expenses for development or support are minimal. Thus, it’s necessary to invest into development or support of the given factors, because one may get some result with minimal expenses	Selective improvement, decrease or move (uncertainty state)
		(0,33-0,66]	Taking into consideration that expenses for support or improvement of the proper factors and weight are average, it’s difficult to distinguish model of the elements development. It’s necessary to analyze enterprise strategy, budget and desirable logistic service	
		(0,66-1]	High expenses and average weight of the factor complicate the elements development model determination. It’s necessary to analyze enterprise strategy, budget and desirable logistic service level. But under conditions of the limited budget, one may recommend to move elements, which have estimation in interval (0; 0,33], because their existing may have negative impact on the general image of the enterprise	
Weak LS elements	(0;0,33]	(0-0,33]	Weight of the element is very low for consumer, but expenses are also little. Depending on the current state of the LS element, it’s suggested to move it, or to supporta partially (with average and high values estimation)	Move; support
		(0,33-0,66]	All LS elements are necessary to move and shorten, especially those, which have high expenses (0,66 – 1] for support, because their existing is not profitable with low weight and average/high expenses	Move
		(0,66-1]		

It is important to create priorities at this stage, because attempt to optimize simultaneously various components, requires great expenses of sources, time and has higher opportunity to cause unsatisfied results. That's why determination of the first, second and other levels tasks has to be conducted before starting of the optimizing processes. Such prioritization may be formed after enterprise strategy analysis, existing budget and desirable level of the logistic service. It can be formed through transformation labour intensity determination, i.e. simpler and less costly optimization processes will get much priority for further development, than those, change of which needs to rebuild business or logistic processes.

Considering the fact that under market competition conditions there is risk that this or that product or service existence conditions are constantly changed. It may be connected with new competitor's coming to the market or alternative service. One has to know that priorities are dynamic factors, which can be constantly changed, helping to adapt to the new factors. That's why all factors have to be maximum considered, which influence priorities of these or those rebuilds. In future it will help to calculate new priority and to increase or vice versa to decrease order to introduce new components of the logistic process or change and optimization of the existing ones.

The *fifth stage* is to determine optimal level of expenses for logistic service considering its desirable level. This stage is important, because those internal investment spheres are defined, which lead to improvement of the logistic service provision, saving profitability of the producing processes. This stage uses information, received at the previous stages, and is based on data concerning logistic process rebuild.

Owing to the fact that logistic provision is important, but not only one constituent of the production, it creates some limits concerning financial support of the logistic service transformation through demands introduction to the rebuild profitability. Thus, all transformational processes have to take place holding condition, that they will not worsen state of other constituents in the production process. They are the most optimal from the position of good producing or service giving and don't cause financial balance trouble in the economic processes at the enterprise.

It's important to know that one of components at this stage is to determine desirable level of the logistic service. Optimization and improvement are two processes, which are greatly strained in time frame, considering that all enterprises have aim to get profit, the result of such operations is expected in the shortest term. That's why the definition of the desirable service level allows to save time in less optimization processes, and as a result to decrease expenses and to get positive result after logistic service standards establishment at the enterprise in the shortest term.

Conclusions and perspective for further researches. The given work deals with logistic audit essence and its value, with main stages of logistic service audit and informational support at these stages. Also author characterizes in details behavior model concerning logistic service factors analysis, which includes trimeric decision making matrix. Having analyzed the matrix, one may define which elements of the logistic service are necessary to move, develop or support immediately or gradually.

The conducted analysis does not solve the problem and requires further studies, which concern analysis and specification of the logistic service audit theoretical and practical aspects as enterprise innovative activity component.

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Основні аспекти аудиту логістичного сервісу

У статті охарактеризовано сутність логістичного аудиту та розглянуто його значення, сформульовано основні етапи аудиту логістичного сервісу та інформаційне забезпечення цих етапів. Також подано детальну характеристику моделі поведінки стосовно аналізу показників логістичного сервісу, що включає в себе побудову тривимірної матриці прийняття рішення.

Ключові слова: логістика, логістичний сервіс, аудит логістичного сервісу, логістичний аудит, тривимірна матриця.

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Основные аспекты аудита логистического сервиса

В статье охарактеризовано сущность логистического аудита и рассмотрено его значение, сформулированы основные этапы аудита логистического сервиса и информационное обеспечение этих этапов. Также представлено детальную характеристику модели поведения относительно анализа показателей логистического сервиса, которая включает в себя построение трехмерной матрицы принятия решения.

Ключевые слова: логистика, логистический сервис, аудит логистического сервиса, логистический аудит, трехмерная матрица.

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