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**ЛОГІСТИЧНЕ ОБСЛУГОВУВАННЯ У КАНАЛІ РОЗПОДІЛУ**  
**ІННОВАЦІЙНОЇ ПРОДУКЦІЇ ЯК ЧИННИК ОПТИМАЛЬНОЇ ЙОГО**  
**СТРУКТУРИ**

*У статті досліджено логістичне обслуговування в умовах формування оптимальної структури каналів розподілу інноваційної продукції, що забезпечує доведення інноваційного товару чи послуги від виробника до споживача, одночасно враховуючи інтереси обох сторін.*

*Ключові слова: логістика, канал розподілу, інноваційна продукція, оптимальна структура, логістичне обслуговування.*

**Елена А. Беловодская, Наталия В. Гайдабрус, Людмила Ю. Сагер**  
**ЛОГИСТИЧЕСКОЕ ОБСЛУЖИВАНИЕ В КАНАЛЕ**  
**РАСПРЕДЕЛЕНИЯ ИННОВАЦИОННОЙ ПРОДУКЦИИ КАК ФАКТОР**  
**ОПТИМАЛЬНОЙ ЕГО СТРУКТУРЫ**

*В статье исследованы логистическое обслуживание в условиях формирования оптимальной структуры каналов распределения инновационной продукции обеспечивает доведение инновационного товара или услуги от производителя к потребителю, одновременно учитывая интересы обеих сторон.*

*Ключевые слова: логистика, канал распределения, инновационная продукция, оптимальная структура, логистическое обслуживание.*

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**LOGISTIC SERVICE IN THE INNOVATIVE PRODUCTION**  
**DISTRIBUTION CHANNELS AS ITS OPTIMAL STRUCTURE FACTOR**

*The article deals with research on logistic service under conditions of the optimal structure within innovative production distribution channels. It provides*

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*the delivery of the innovative product or service from producer to consumer, taking into account interests of both sides at once.*

*Key words: logistics, distribution channels, innovative production, optimal structure, logistic service.*

**Problem statement and its connection with important scientific and practical tasks.** One of the main challenges for domestic producers is promptly and quickly satisfaction the demand, formed by marketing with minimal expenses. It should be provided by the efficiency of moving and products preservation during the delivering to the final consumer, and permanent increasing level of logistic service. The main tool able to perform such tasks is optimally structured distribution channels, which is applied by the enterprise to bring end products to the target consumers. At the same time distribution channels not only affect the whole marketing program of the enterprise, but also provide long-term commercial agreements with its subjects, which are difficult to be changed in future. Depending on the size, power of the enterprise-producer, products variety and other factors, the enterprise may have one, few or many distribution channels. Besides they may differ from each other by structure, trade intermediaries' types and intermediate storages, carriage, transport types etc. Within this framework, the topical problem is to form optimal distribution channels and it needs to be investigated further. And the logistic service as a key to its successful formation becomes important.

**Latest research and publications analysis.** The local and foreign scientists' works deal with theoretical and methodic grounds to control distribution channels; particularly they present approaches, which are connected with investigations concerning channel form and structure choice. These researchers include Bowersox D., Closs D. [17], Kotler Ph. [20], Woichak A.V. [3], Hertsyk V.A. [4], Golubin Ye.V. [6], Trydid O.M. [14], Stern L., El-Ansari A., Koflan E. [15], Shcherbak V.G. [16] and others. The problems to control lines streams in distribution channels are reflected in works of Gordon M.P., Karnaukhov S.B. [7], Johnson D., Wood D., Wordlow D., Merphy-Mol. P. [8], Ivanov D.O. [9], Krykavsky Ye.V. [10], Handfield

R., Nickols E. [19] and others. Methods to organize product distribution in channels are represented in works of Apopiy V.V. [1], Vynogradskaya A.M. [2], Goloshubova N.O. [5] and others. The research of nonconformities between real service quality and consumers' expectations is described in such scientists' works as Parasuraman A., Zeithaml V. and Berry L. [20], Gronroos K. [21], Lewis R. and Booms B. [22]. Lambert D., Stock D. and Sharma A. [23, 24] worked on the problems of service audit.

In practice there is unsolved issue concerning optimal structure forming of innovative production distribution channels. It provides the effective logistic service and bringing of the innovative goods or service from producer to consumer, taking into account their interests at once.

Thus, **the research objective** is to improve theoretical and methodic approaches to form optimal structure of innovative products distribution channels, based on the logistic service.

**Key research findings.** *Optimal structure of the innovative products distribution channels* is considered such ratio of quantity and distribution line participants' types, which provides delivering of innovative product or service from producer to consumer, taking into account their interests at once.

We suppose that optimal distribution line forming is based on qualitative analysis of channels length and width, intermediaries' types, included to it, and is conducted upon their conformances to two main *requirements* (fig. 1):

1) potential to create conditions to achieve stated objectives by commodity producer (new market penetration, desired market segment providing, support of the new good differentiation measure etc);

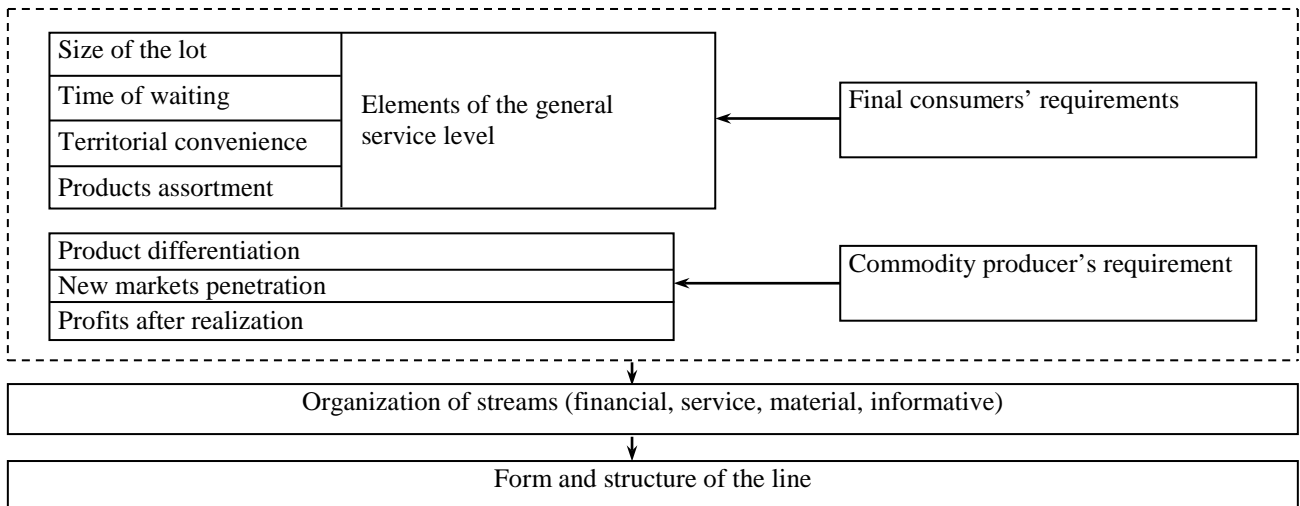
2) adequate service of target markets consumers.

Let's observe them in details.

The realization of the *first requirement* is possible, if you take into consideration the following *factors* [14]:

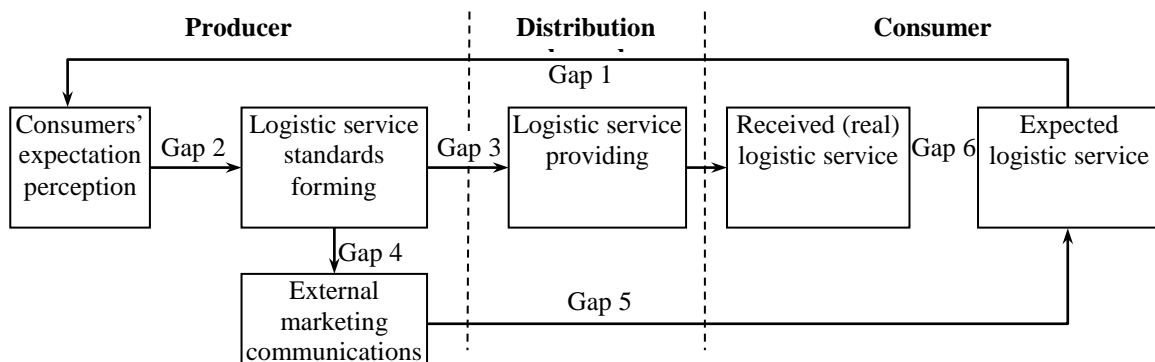
1. Market type determination.
2. Sales amounts in the market typical for the enterprise.

3. Level of purchasers' concentration by geographical feature.
4. Consumers' habits.
5. Profit level.
6. Necessities in sale and post-sale technical services.
7. Enterprise size and its financial situation.



*Figure 1. Requirements to form and structure of the distribution line, author's development*

Scientists Lewis R. And Booms B. [22] think, that service quality essence consists in that fact, how much it satisfies consumers' expectations at average. It means that clients may have nonconformities between real received logistic service and its expectations. To analyze mentioned differences one suggests to use adapted model of Parasuraman A., Zeithaml V. and Berry L. [23], which defines place of nonconformities (Gap) on the way to realize consumers' expectations concerning logistic service (fig. 2).



*Figure 2. Adapted Gap-model of nonconformities on the way to realize consumers' expectations concerning logistic service, author's development*

As we may see from fig. 3, there are following gaps on the way to realize consumers' expectations concerning logistic service:

- gap between consumer's expectation and producer's perception of these expectations (*Gap 1*).

- gap in the conversion process of consumer's perceived expectations by producer into logistic service standards (*Gap 2*).

- gap in the process of logistic service giving means distribution channels participants' impossibility to interpret settled logistic service standards in right way (*Gap 3*).

- gap in the process to interpret logistic service standards into marketing communications (*Gap 4*).

- gap in the process of external marketing communications impact on the consumers' expectations forming (*Gap 5*).

- gap by consumers between received and expected logistic service (*Gap 6*).

One suggests to use internal and external audit in order to reveal above mentioned gaps. Researchers Stock D. and Lambert D. [21] think that the main tasks of **external audit** are:

- to determine important service elements for consumers to make decision concerning purchase;

- to define how consumers accept service, suggested by sellers.

Thus, the external audit results in the information obtaining on real service level and level, which is expected by consumers from producers (*Gap 6*).

The main aim of **internal audit** is to reveal nonconformities in techniques, used by the company, and those, which cause gaps between real and expected logistic service by consumer.

Due to data, received after audit, one suggests to create matrix of competitive positions with such coordinates: weighting and estimation of the proper factor (fig. 3).

The weighting of logistic service quality factor is determined with expert method [25]. It is necessary firstly to form representative experts groups, quantity of

which may be found by formal and informal ways. While using formal way the experts' quantity is determined on the basis of special formulas calculations [25, 26]. Informal method foresees to involve indefinite number of experts – 10-20 persons, although in some cases there may be more or less of them.

		Competitive arrearage	Competitive parity index	Competitive advantage		
Weighting of the logistic service quality factor	<i>Important weak sides</i> <b>Fast advance</b>		<b>Advance</b>	<i>Important strong sides</i> <b>Support / advance</b>	High	
	<b>Advance</b>		<b>Support</b>	<b>Worsening / support</b>	Middle	
	<i>Secondary weak sides</i> <b>Support</b>		<b>Worsening / support</b>	<i>Secondary сильні сторони</i> <b>Worsening / support</b>	Low	
Evaluation of the logistic service quality factors						

**Figure 3. Matrix of the competitive positions**

*Source: improved on the basis of [6, 14]*

Experts' group is formed by competent persons in logistic service and present interests of various interested groups. Particularly it may include managers and leading specialists at the enterprise, for which analysis is conducted, and counter-agent, who take part in logistic service and involved experts concerning work conditions in the analyzed market.

Weighting of each factor is calculated by formula [12, 11]:

$$W_{Ei} = W_{Mi} \frac{\sum_{j=1}^m W_{ij}}{\sum_{i=1}^n (\sum_{j=1}^m W_{ij})}, \quad (1)$$

where  $m$  – quantity of experts;  $n$  – quantity of estimated factors, which are observed;  $W_{ij}$  – rank, got by  $i$ -th estimated factor, set by  $j$ -th expert.

The sum of weight is equal to 1.

After that one should find experts' thoughts conformity while evaluating logistic service quality factors. We propose to use Kendall's concordance coefficient (agreement)  $W$  ( $K_{conc}$ ) and Pearson's criterion ( $X^2$ ).

Concordance coefficient is calculated by formula [11, 12]:

$$K_{conc.} = \frac{12 \sum_{j=1}^n d_j^2}{m^2 (n^3 - n) - m \sum_{i=1}^m T_i}, \quad (2)$$

$$d_j = S_j - \frac{\sum_{j=1}^n S_j}{n}, \quad (3)$$

$$S_j = \sum_{i=1}^m R_{ij}, \quad (4)$$

$$T_i = \sum_{e=1}^L (t_e^3 - t_e), \quad (5)$$

where  $l$  – quantity of connected (similar) ranks;  $t_l$  – quantity of connected ranks in each group.

Concordance coefficient is changed within  $0 \leq K_{conc} \leq 1$ . The bigger concordance coefficient is the higher level of experts' thoughts agreement. With full agreement of experts' thoughts  $K_{conc} = 1$ , and with full disagreement  $K_{conc} = 0$ . Its low value may be received either without all experts' thoughts generalization, or with opposite thoughts between experts' subgroups, although the group has high agreement level.

Statistic significance of the concordance coefficient is checked by Pearson's

criterion ( $X^2$ ) [11, 12]:

$$X_p^2 = \frac{12 \sum_{j=1}^n d_j^2}{m \cdot n \cdot (n+1) - \frac{1}{n-1} \sum_{i=1}^m T_i}. \quad (6)$$

Calculated value ( $X_p^2$ ) is balanced with table value ( $X_m^2$ ) for n-1 freedom stages and trustful probability ( $P = 0,95$  or  $P = 0,99$ ). If  $X_p^2 > X_m^2$ , the concordance coefficient is essential, if  $X_p^2 < X_m^2$ , it is necessary to increase experts' number in the group.

In order to estimate characters of low, middle and high weighting factors concerning logistic service quality it is necessary to determine maximum (max) and minimal (min) value for matrix analysis. Intermediate values ( $k_1, k_2$ ) are calculated by formula:

$$k_1 = \min + (\max - \min) \div 3; \quad k_2 = \min + 2 \times (\max - \min) \div 3 \quad (7)$$

Factors, appearing in the box “competitive advantage – high weighting” are the strongest in the producer’s hands. And another most important but weak is “competitive arrearage – high weighting”. These factors need fast improvement, because they are very important for consumer. Factors in the box “competitive advantage – low weighting” is the secondary strong sides of the enterprise. They are not important for consumer, that’s why it is necessary to support and persuade consumer, that they are important and in other case one has to decrease level of resource provision for their support.

The choice of variants to form *line structure* is determined with such *objectives*:

- to provide available sale;
- to decrease maximum expenses for intermediaries’ service.

Analyzing the distribution channels structure, it is obvious that each line has its own features depending on economy branches and differences while creating each of them. Differences in distribution channels are in evidence within one enterprise due to separate product categories. It is attributable to some goods consumption specific.

More firms, engaged in products distribution, propose them in the market through intermediaries. Each of them tries to form its own channel.



Thus, while choosing *distribution line structures* the following *factors* under technical and economic analyses are:

- to define number of possible intermediaries due to the distribution policy type (exclusive, intensive or selective), marked price (with and without discount), from formed market price and probable trade margins, made by each channel participant;
- to choose intermediaries' type by judicial and economic features and by goods amounts, which they are able to buy. Also on the basis of advantages and disadvantages analysis of each type concerning company key tasks in the products distribution sphere;
- to choose line organization scheme (functional and linear, divisional or matrix);
- to define principles of producer's and intermediaries' clearing payments;
- to estimate variety of stocking logistics (storage is in the enterprise territory, how closer to the consumer etc) and transport logistics (own or rent transport etc).

Thus, mechanism to make decisions on the distribution line optimal structure is based on economic and technological good distribution reasonability analysis by beneficial way both for producer and final consumer. Besides, one should take into account the intermediaries' motivation system while making decisions concerning their participation in the line, possibility to control their actions and joint work risk level.

**Conclusions and perspectives for further research.** As conclusion it should be noted, that intermediaries, who are in the channel and do the same work, not always conduct it on the same level: relations with some intermediaries will be more beneficial, than with others. To determine which line makes more profit for company, and which – loss, it is necessary to analyze each relation aspect with separate intermediaries. Having divided intermediaries into groups owing to profitability, company-supplier may conduct differential policy towards its partners, and at the same time it optimizes its sale.

Nowadays we may affirm that problems to form distribution channels structure, particularly, to analyze the existing situation, are important constituents of the enterprise activity. That's why it's important to investigate this problem further.

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