Assessment of Customer Satisfaction in Logistic Operators

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Among numerous factors which affect a company's success on the market, the customer satisfaction is an important element. This paper presents a proposal for customer satisfaction assessment procedures which takes into account customer segmentation. A survey was carried out among the customers of the Silesian branch of an international logistic operator. As a result, CSI was measured in selected segments, quality maps were prepared and logistic customer service elements requiring improvement were proposed.

Keywords: Customer Satisfaction Index, quality maps, logistics customer service.

1. INTRODUCTION

The Logistics-Shipping-Transport sector (LST) has been developing dynamically over the last years and provides a perfect case study of both improvement of the level of customer service and creating network relations. In the context of creating network relations on the Polish market in this sector, the following business models can be distinguished in particular: Logistics Operator, Logistics Integrator and Conductor. The development of logistic networks goes according to the evolution of logistic protection of supply chains from the 2PL Concept (the second logistic participant) through the 3PL Concept (the third logistic participant) and the 4 PL Concept, towards the 5PL Concept. Changes in business models of logistic organizations are connected with the needs of industrial, commercial and service companies directed towards providing product accessibility to end users, according to their needs. As far as final customers (the last chain link in a supply chain) are concerned, these needs can be different, which is reflected in different perception of the meaning of elements of logistic customer service. Consequently, customers of logistic enterprises can also variously prioritize logistic service through enterprises of the Logistics-Shipping-Transport sector (LST).

The aim of this paper is to indicate a procedure for assessment of LST customer satisfaction regarding priorities for individual segments of consumers. The research focused on customers of a selected logistic operator of its Silesian branch, using the procedure aimed at determining a service strategy and improving the service processes with regard to segmentation of consumers.

In connection with such a main aim, the paper indicated gaps in customer service referring them to the specificity of the LST sector. In order to achieve this, the authors indicated the role of the logistic operator in a network of logistic enterprises. The following part of the paper aims at specifying more precisely the methodology of the assessment of customer satisfaction. This methodology was used in the last part of the research in a case study of a selected logistic operator.

2. GAPS IN CUSTOMER SERVICE ON THE LST MARKET

Customer service involves all operations which aim at designing standards of service, order processing and post-sale service [Kramarz 2012, Spyra 2009, Kempny 2001]. Customer service is a wide term and is difficult to be defined explicitly. This term involves all dimensions of contact with customers, including both material and immaterial

elements. In connection with a broad depiction of this term it can be noticed that it is both a marketing and logistics domain. Consequently, it is becoming one of the key areas of marketing logistics. [Kramarz 2014]

Individual phases of customer service (pre-transactional, transactional and post-transactional ones) are diversified depending on the type of the enterprise, the industry branch and the role which the enterprise plays in the in the supply chain. The enterprise should identify the actual consumer needs and determine service standards to fulfil those needs. Service standards and the degree of their fulfilment determine the quality of customer service.

Consequently, defining the level of customer service involves three key categories:

- service quality (conformity of the fulfilled service parameters with the standards appointed in the service policy),
- service standards (desired level of service parameters appointed on the basis of investigations into customers' preferences; they are norms of the fulfilled service processes),
- customer satisfaction (a a customer's subjective feeling resulting from the comparison of the obtained service with expectations as a purchase standard).

In the area of determining customer satisfaction it is worth taking into account the knowledge from the theory of consumers' choice, including especially the rules of the consumer buying behaviour.

Treating the consumers' behaviour as a sum of activities connected with obtaining and using products and services and disposing them, together with the previous decisions determining those activities, four basic rules determining consumer attitude while choosing can be indicated [Smyczek, Sowa, 2005; Mitręga, 2003.]:

- The compensation rule which assumes that choosing a given product from among other products requires regarding all the product features (including all elements of logistic customer service) and comparing it with "the ideal", deciding to purchase it, is therefore a decision to resign from some features of the ideal;
- The threshold rule which assumes that one undesirable product feature (or logistic customer service) can cause its being rejected;

- The distinctiveness rule, according to which a chosen product feature (or an element of logistic customer service) exceeds other product features (or elements of logistic customer service);
- The selection rule in which choice is based only on several product features (or logistic customer service) and the rest of them is not taken into account; the consumer defines priorities before making a choice.

Therefore, in the assessment of customer satisfaction it is essential to specify which rule customers use in their decisions about purchasing logistic services. The logistic operator, as an enterprise offering a wide range of logistic services, most often in the form of packages involving services connected with transport, terminal service, distribution and storage and other, informational and financial services, defines the customer as a subject who is an employer of the realized logistic service.

The methodology of investigations into the level of customer service of the logistic operator refers to the procedure which has already been well-known from the research conducted in industrial and commercial companies. Individual milestones of the assessment of the level of customer service result from gaps in service (Fig. 1).

Gap 1 means the difference between the established parameters of performing/rendering a service (with standards) and the service quality expected by the customer. This gap arises in the transactional phase of customer service. It results from wrongly carried out investigations into customers' preferences. In connection with those errors, the customer service standards become wrongly defined. The problem can also result from treating the whole group of consumers homogeneously and does not take into account particular needs of different segments of consumers. In the case of LST there appear an additional problem resulting from the fact that the node which is the customer (the employer) is the subject which usually does not correspond with the node which is the consumer of the product.

Gap 2 appears in the transactional phase - the realization of logistic service by the logistic operator. This difference results from the fact that the actually realized process does not correspond with the standards determined in the pre-transactional phase. Therefore, the problem with realization of the process appears on the level of
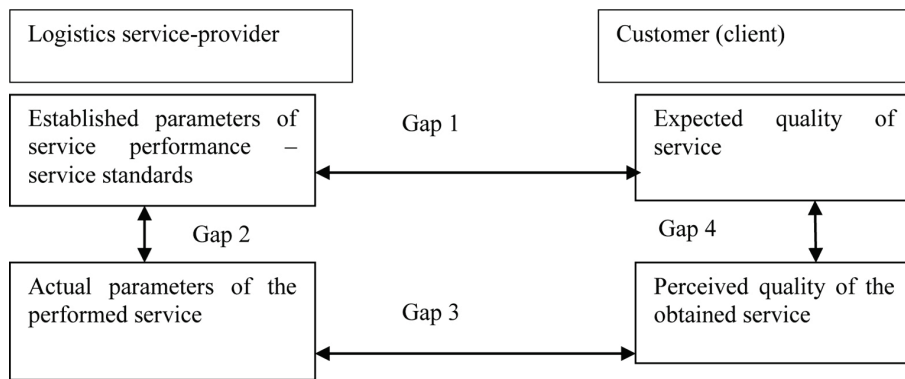
Fig. 1. Gaps in customer service.
Source: The study based on M. Mitręga. Relationship marketing. Theory and practice, CeDeWu, 2008.

the realization of logistic tasks according to the standards determined in the customer service policy. Such a state can be caused by:

- wrongly realized processes - processes are not realized according to the accepted customer service policy or processes are realized according to the accepted policy, but this policy became wrongly defined (the accepted procedures prevent realization of the accepted standards, or they are too general),
- disturbances (difficult to predict) - events causing deviations in material flows, appearing at the stage of the realization of processes.

Gap 3 is a difference in perception of the quality of the actually realized service with relation to the parameters of performance of the service determined by the service provider. The problems appearing at the stage of Gap 1 and 2 can have their consequences in wrong acceptance of the assessment indicator of the satisfaction level. In particular, a wrong definition of customer expectations has its consequences in its real perception of the service level. Problems can be

connected both to underestimation of elements of logistic customer service and inflating the level. Consequently, excessive differentiation of the service level, too large flexibility, can be imperceptible by the customer, as activities providing an additional value, which means the supplier bears costs but does not create any additional value. Consequently, customers (employers) in LST confront their own assessment with the assessment of their customers (consumers of products) and together these subjective impressions decide about the final customer satisfaction, rated on the level of Gap 4.

Gap 4 is a determination of the real level of customer satisfaction with the process performed by the service provider. The level of customer satisfaction is determined as a difference between the service level expected by the customer and the quality of the actually realized order, perceived by him or her.

The methodology of the research into customer service (Fig. 2) combines investigations into the level, the quality of customer service, the assessment of customer satisfaction with the segmentation of customers.
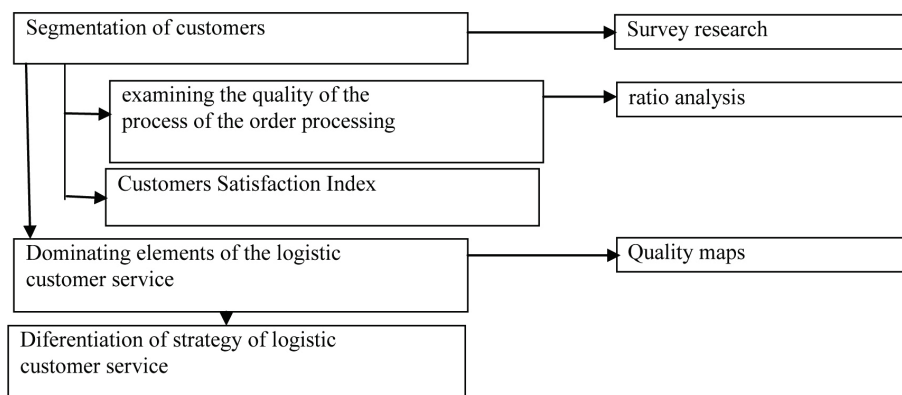

Fig. 2. The procedure of the investigation into customer service..
Source: The authors' study.

Not all the items of the presented methodology are the subject of considerations in the paper. The empirical research does not take into account the results of the stage of the assessment of the quality of order processing as the presentation of these results did not have any influence on the realization of the aim of the paper.

3. THE CONCEPT OF THE RESEARCH INTO THE SERVICE OF CUSTOMERS OF THE LOGISTIC OPERATOR

The key factor for creating a suitable system for managing customer relations and achieving customer satisfaction is adaptation of the service strategy to identified needs. The most important tools which are used for this purpose involve segmentation of customers and deepened marketing research, thanks to which one can identify determined groups of customers, and define their needs and requirements towards the supplier.

The top-down market segmentation, proposed by different scientists (Duliniec, 2009, pp. 187-188), focuses on features characterizing: customer behaviour, the manner of product utilization, advantages expected by the customer, expected product attributes, the customer's attributes (demographic, social, cultural and psychological criteria).

In marketing research, where segmentation is used among other things to create advertising campaigns, stimulate sales, adapt methods and selling techniques, it is very popular to separate homogeneous groups as regards consumer behaviour. Similarly, a wish to improve logistic service induces to search for such criteria of segmentation which will allow, in a given segment, combining customers with similar preferences regarding logistic customer service. However, criteria indicated in the top-down (secondary) segmentation cannot always be used for this purpose, so it is essential to improve methods of the original (bottom-up) segmentation. Assuming that the correctly carried out segmentation allows proper allocation of limited resources among homogeneous groups of consumers so as to create the value added expected by customers [Quinn, Hines, Bennison, 2007; Dibb, Simkin, 2009; Barens,. Bauer, Neumann, Huber, 2007], separated segments must be so explicit as to indicate those elements of creating the value added which the customer will really want to pay for. For each particular case (an enterprise or a supply chain) one should accept a classification differentiating possibly most clearly all the population of customers, which allows positioning the strategy of logistic customer service. This means that in every homogeneous group (segment) one can indicate a feature which will have similar values for individuals from this group, however, in other segments this feature will take definitely other values. In order to achieve this, the original segmentation (bottom-up) is used and conducted according to concentration. Variables differentiating concentrations can be elements of logistic customer service and, more precisely, the importance of individual elements.

The notion of the analysis of concentrations included several separate classifiers. The most important include k-averages and maximization of the expected value - EM (Expectation Maximization). The use of k-averages for segmentation of customers is based on providing the number of groups into which a certain data set will be divided. One of the methods of this classifier is selecting a customer at random from the analysed group and regarding him or her as the main point of a group. Each of the other objects of interest of logistic customer service department is attached to a given group based on its resemblance to a point or the centre of the group. Calculations of the resources of next subgroups narrows down the number of customers in the area taken into the process of segmentation. This procedure is repeated until in a certain iteration none of the investigated customers changes the subgroup in which he or she was placed. This can be changed due to the evolution of requirements or financial matters. The disadvantages of this method of segmentation include the necessity of specifying the number of concentrations at the beginning of the analysis. Hence, enterprises carry out a analysis of concentrations by means of k-averages several times. The research presented in this paper took into account this method. Three concentrations were appointed. The number of segments results from the top-down strategy of the enterprise. Increasing the number of segments is connected with an increase in costs, (whereas customers, crossing a certain threshold do not perceive any additional value added) as a result of excessive differentiation of the customer service policy. The base of customers indicated by the enterprise authorizes to such a division.

The EM method is frequently called an analysis of probable concentrations. Statistical software (e.g. STATISTICA) determines concentrations

assuming different variable probabilities. Like in the analysis of k-averages, the starting point is providing the number of concentrations. Investigating a group of customers of a given enterprise from an angle of one invariable feature, that is, for example distance, allows indicating a distribution of this feature according to the thickness function. The EM method aims at appointing distribution parameters on the basis of distinguishing it from the entire group. Classifying customers by means of EM is based on probability. This method will be applied in the next stages of the research. However, for this purpose it is planned to widen the database of customers delivered by the enterprise with potential customers.

In addition, the findings of the research carried out on a sample of 45 organizations allowed indicating the level of customers satisfaction in each of the separated segments.

In their research the authors used an integrated indicator of assessment of customer satisfaction - the Customer Satisfaction Index (CSI). The CSI index (Customer Satisfaction Index) is a complex indicator in which all elements of logistic customer service can be connected (time, punctuality, certainty, completeness, flexibility, availability, service staff competence, communication, comfort of placing orders) [Marciniak, 2000]. The indicator is built on the basis of weighted assessment. It takes into account both assessment of individual elements and their importance for the customer.

The CSI indicator was determined by the following example:

$$CSI = \sum_{i=1}^{N} w_i * C_i$$

i, 1 …n – elements of logistic customer service

w_i- the importance of an element of logistic customer service

o_i – the assessment of an element of logistic customer service

When determining the maximum value of the customer satisfaction index, a proportional customer satisfaction indicator can be provided.

$$CSImax = \sum_{i=1}^{n} w_i o_{i\,max}; \qquad CSI\% = \frac{CSI}{CSI_{max}}$$

The findings were deepened with a analysis of quality maps. Quality maps are a technique of graphic presentation of the results of the

assessment of customer satisfaction. They are made based on comparing two parameters: the importance of a feature for the customer, customer satisfaction.

4. CUSTOMER SATISFCTION OF A SELECTED LOGISTIC OPERATOR

The object of the research is a global logistic operator with over 10 years of experience on the Polish market. As a part of full customer service, except parcel-transports, the enterprise realizes the service of Full Truckload Shipping (FTL), Less than Truckload Shipping (LTL) and special loads (e.g. express), as part of road service, realizes food transports (LTL, FTL), requiring controlled transport conditions. Food Logistics services allow tracking a batch by its production series number and recording temperature at every stage of transport.

The role of this logistic operator in a network of logistic enterprises is not only providing transport services or contractual logistics, but also providing efficient management of possibilities and resources of co-operators such as shipping enterprises, transport or packing operators. Cooperation with other LST enterprises broadens competences of the logistic operator so as to provide customers with most effective and efficient solutions. Therefore, the logistic operator is responsible for realizing the standards of logistic customer service.

The operator's customers include both production and commercial enterprises from different industries. The logistic operator divided its customers according to the annual turnover expressed in Euro: A-type customer - turnover of 250,000 € and more, B-type customer - turnover of 125,000 € - 249,999 €, C-type customer - turnover of 50,000 € - 124,999 €, D-type customer - turnover of 25,000 € - 49,999 €, E-type customer - turnover of 6,000 € - 24,999 €, F-type customer - turnover up to 5,999 €€.

The logistic operator introduced a classification of customers as regards their annual business trade. Such a classification was prepared for the needs of introducing differentiated service standards. Every customer from Segment A and B has a dedicated person in the customer services department, other customers have access to the customer services department, contacting in current matters with individuals who deal with particular areas of work in the division. Solutions offered to customers include: customers from Segment A are also offered a free connection of IT systems a part of

Electronic Data Interchange (EDI), customers of Segment B are offered a 50-per-cent refund of costs resulting from combining the systems, for other customers this payment is 100%. Customers of Segments A, B, C, D, and E. who have a potential of development have access to free accounts on the electronic platform eLogistics through which they can place orders and follow their realization status. Other E-type customers and all F-type customers are offered the manner of placing orders via sending a copy of the order by email.

The research presented in the paper examined opinions 45 customers altogether. The customers indicated what meaning individual elements of logistic customer service have in their decisions about buying.

Analysing the findings in separated segments according to the criterion of the volume of the turnover it can be noticed that those segments are not significantly differentiated either by the assessment of elements of logistic customer service nor by importance. Therefore, it was decided about segmentation based on the meaning of elements of logistic customer service. Three segments were appointed as follows:

Segment 1. A package of logistic services - all elements were assessed as equally important

Segment 2. Punctuality - respondents' opinions reveal domination of the element of punctuality, most often strengthened by the lead time

Segment 3. Flexibility - Respondents regards the ability of the system for processing of non-standard orders as a key feature.

Each segment was described according to the results of the descriptive characterization (Tab.1).

Table 1. The descriptive characterization of segments.

Segment	Prevailing size of an enterprise	Prevailing segmentation according to turnovers	Prevailing customer location
I	Micro	From 650,000 to 1,000,000	None (customers from different regions of Poland)
II	None (both large, average and small enterprises)	Over 1,000,000	Silesian
III	Medium	Up to 430,000	Silesian

Source: The authors' study

In the reception segments distinguished in such a manner, the following CSI indicators were determined.

- Segment I 68%
- Segment II 69%
- Segment III 74%

Low values of CSI indicators are incentives for deeper analyses of the reasons of low satisfaction of customers in each of the segments. With this end in view, quality maps were prepared (Fig. 3).
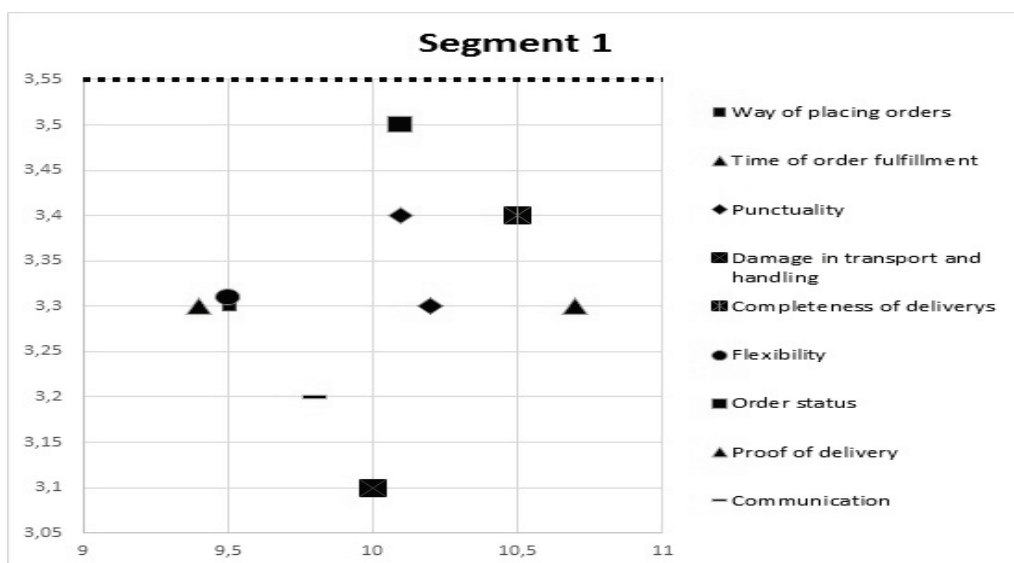

Fig. 3a. Presentation of the results of Segment 1.
Source: The authors' study.

A descriptive characterization of newly separated segments allows indicating certain regularities. The first segment shows the prevailing number of microenterprises and an average volume of turnover (from 650,000 to 1,000,000). The second segment includes only customers prevailing as regards turnovers and locations, however, the third segment (containing the least number of customers) is most strongly determined by independent variables: prevailing enterprises are average enterprises with turnovers up to 430,000 EUR located in Silesia. This segment is not a key one in the enterprise policy.

time, reliability (undamaged, complete and punctual orders) and competences of the service staff. Those elements should form the core of the package of logistic services. Since those elements were rated 3 and below in this segment of the assessment, they should be improved. In Segment 2, a crucial element is punctuality, which received an average rating 3.5. And in this instance (taking 90% CSI as a standard), the element must be improved. The third segment is distinguished by the domination of flexibility, which is supplemented with a need for tracking the shipment and current information about the status
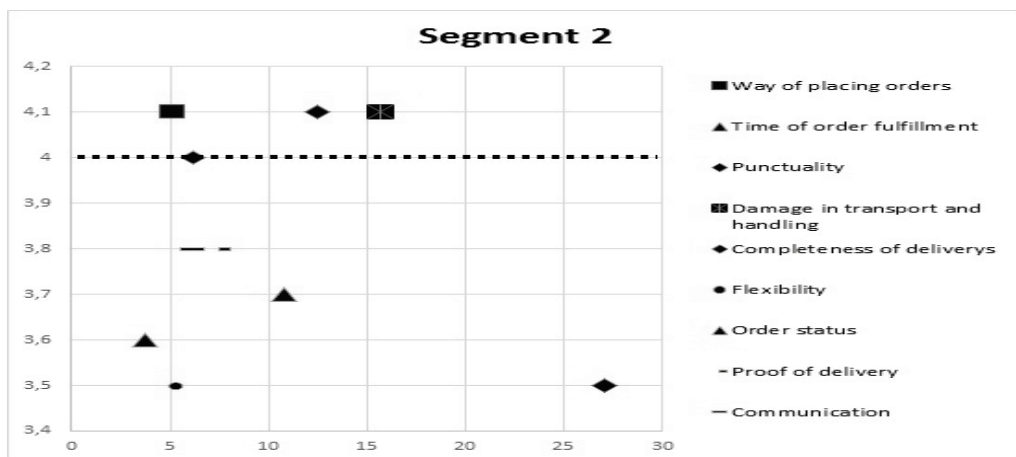

Fig. 3b. Presentation of the results of Segment 2.
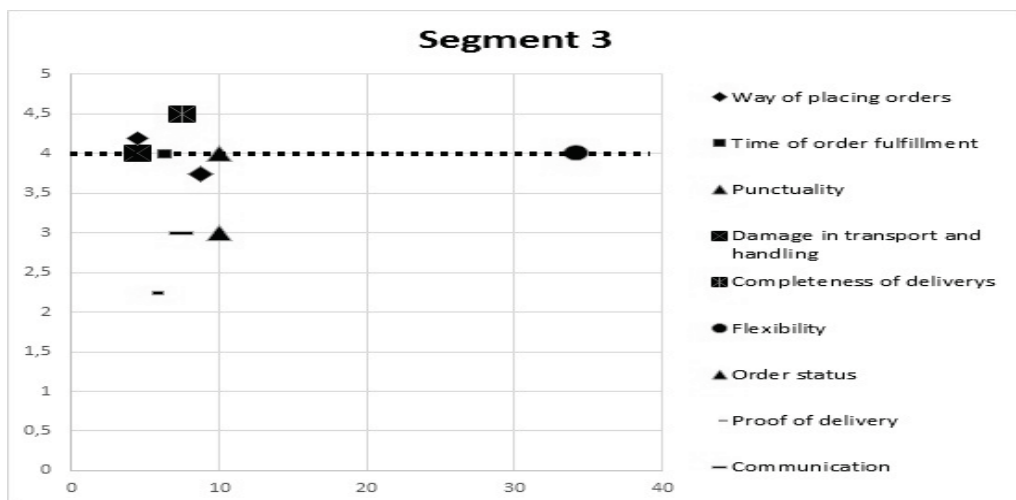Source: The authors' study.

Fig. 3c. Presentation of the results of Segment 3.
Source: The authors' study..

Process maps allow indicating those elements of logistic customer service which require improvement. In the first segment, all elements of logistic customer service require improvement. Respondents attributed a similar meaning to all elements. Items which slightly dominate include:

of the order. Flexibility is rated relatively high by respondents (the average value is 4), however, tracking the shipment, communication with the customer were rated at the level of 3. Increasing the standard of service requires improvement of this element.

Therefore, the key items are indications regarding improvement of punctuality of the realized orders and competences and communications with the customer (including tracking the shipment).

However, the key result of the research is indicating differences in segmentation proposed by the enterprise with relation to the results of the original segmentation based on preferences of logistic customer service.

5. CONCLUSIONS

In contemporary supply chains, relations with customers are treated as one of key resources. Segmentation, when carried out correctly, is supposed to indicate, first of all, how to build a strategy in order to keep customers and ensure their loyalty. However, it can be used simultaneously, for creating limits for the positioned strategies of service, indicating those groups of customers for whom adjusting the strategy will be simply unprofitable for enterprises. Consequently, the findings indicate whether it is profitable to create strong relations with customers and if so, with which group of customers. Another important aspect is the defining to which degree service standardization can be introduced. Standardization ensures that to a certain degree the order processing runs the same for all separated segments and only selected attributes of the realized process are differentiated for the needs of specific segments.

In the investigated organization segments separated on the basis of the meaning of elements of logistic customer service do not correspond to the original segmentation of customers. The original segmentation of customers is crumbled very much and it does not show any interrelations with the original segmentation.

This research can be treated as a pilot study. The proposed methodology will be used in other logistic networks. Moreover, there is a plan to include in the presented conceptions investigations into the distinctness of setting up the strategy of logistic customer service in dominated networks and in networks of equal partners.

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