CUSTOMER SATISFACTION WITH THE QUALITY OF THE LOGISTIC SERVICES

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ABSTRACT. Background: Logistics services are evaluated mainly by measuring customer satisfaction. Measurement of the customer satisfaction provides the information about how organizations operate as well as how to effectively satisfy customer needs. The aim of this paper is to propose an evaluation model of the customer satisfaction of the quality of the logistic services provided. The research in this paper was focused on the evaluation of the level of customer satisfaction in the context of logistics service as well as on the analysis of importance of ten logistic services attributes influencing customer satisfaction.

Methods: The research was conducted on the basis of the questionnaire designed for purchasers of logistic services. The subjects of the research were companies which are using refrigerated transport.

Results: To define relation between level of customer satisfaction in the context of logistic service and logistic service attributes impacting this satisfaction Pearson's correlation method was used. In turn the model to evaluate the customer satisfaction in the context of logistic services in scope of refrigerated transport was built using multiple regression and stepwise regression methods.

Key words: quality, customer satisfaction, logistic services, refrigerated transport.

INTRODUCTION

Subject of logistics services is to present universe of discourse in research among others such as authors e.g.: Świtała [2013]; Wejers, Glöckner and Pietras [2012]; Kilibarda and Andrejic [2012] as well as Strojny [2008]. Logistics services can be evaluated first of all by measurement of customer satisfaction. The concept of customer satisfaction can be defined in different ways in literature. According to one's definition customer satisfaction is "feeling, that to experience purchaser after the service is used which fulfil his expectations" [Kotler, Armstrong, Saunders, Wong 2000]. In order to evaluate customer satisfaction experienced service needs to be measured on the basis of customer expectations compared to

what was delivered. Then the subjective feelings accompanying the usage of the offered service are the basis for effective and reliable evaluation as well as to assure the right picture of perceived service. Measurement satisfaction delivers information to the point function about organization and satisfying customer needs in an effective way. During evaluating customer satisfaction a different scope of guild services can be considered.

Factors influencing customer satisfaction in opinion B. Filipiak and A. Panasiuk [2008] are among others: timeliness of deliveries, completeness of deliveries (productive capacity to realization of ordering products), promptness of deliveries, accurately invoiced, accurately of deliveries, flexibility of deliveries, keeping the commitment

(conditions of agreement), transportations conditions, terminal conditions (theft protection, work organization, furnishings, etc.) and complexity of services.

Term of extent customer satisfaction in TSL area was H. Brdulak's research subject [2009]. In "Perfect profile of logistics services company" as seen by customer due to quality of service six parameters were considered such as: transport of undamaged condition, meeting deadlines, keeping the commitment, certainty of avoiding theft or missing commodity, promptness of order realization and complexity of service. However M. Kozerska's research [2010] in order to term of extent customer satisfaction connecting with level of quality logistics services considered twenty two following parameters: meeting deadlines, successful service on the first attempt, documentation free for mistake, good information flow between logistics service provider and buyer, transport of undamaged condition, complexity of service, kindness, politeness, competence, professionalism, realization, appearance, availability, flexibility, quick reaction to customer requirements, interest in solving customer issues, complains, damages, recommendation another customers, financial credibility, operation time of company on the market and credibility of management.

However research conducted by Logistics Operator of the Year [Special Report 2009], [Special Report 2010], [Special Report 2011] connected with extent of customer satisfaction from quality level logistics services reflected thirteen criteria of evaluation logistics services such as: accurately of deliveries, timeliness of deliveries, completeness of deliveries, price according to the offered quality, information flow to the point of condition deliveries, promptness of deliveries, flexibility of deliveries, experience and credibility, executive potential, reply period to offer inquiry, disputes and complaints, geographic range of deliveries, computerization, complexity of services and innovativeness.

MATERIAL AND METHODS OF OWN RESEARCH

The aim of conducting research was to propose an evaluation model of the customer satisfaction of the quality of the logistic services provided. To the analysis were taken ten quality features from among thirteen logistic services features influencing customer satisfaction, propose by Logistics Operator of the Year, because this features are most widespread, and research conducted systematic [Special Report 2009], [Special Report 2010], [Special Report 2011].

The conducted direct research had quantitative character. It was prepared two questionnaires to realization of research aims. One's was referred to group of 1321 subject and was received from 269 companies which are using refrigerated transport.

In order to describe relation between evaluation of satisfaction from logistics services quality in refrigerated transport area on evaluation of an importance of a feature of logistic service influencing customer satisfaction from service quality a Pearson's correlation was applied. To propose an evaluation model of the customer satisfaction of the quality of the logistic services provided multiple linear regression was applied. In this case of analysis forward stepwise regression [Wątroba 2003] was selected. It was determined, that evaluation model of the customer satisfaction of the quality of the logistic services provided as theoretical description of researching the phenomenon will be characterize by following features: a simplification of reality, in a sense of criteria convergent with reality, enough simple that will be conceivable analysis this model comprehensible methods and will be source about researching phenomenon [Findeisen, Gutenbaum 1985].

RESULTS AND CONCLUSIONS

Quality of logistics services provided should be evaluated first of all on the basis of evaluation of customer satisfaction. In this connection logistics purchasers were asked

about opinion in the area of evaluation of an importance of a feature of logistic service influencing customer satisfaction from service quality. Results including hierarchy of

evaluation of an importance of a feature were announced in table 1.

Table 1. Evaluation of an importance of a feature of logistic service influencing customer satisfaction from service quality
Tabela 1. Ocena ważności cech usługi logistycznej wpływających na satysfakcję klienta z jakości usługi

Features of logistic service	Average evaluation of an importance (pt.)	Percentage of responses [%]					
		Not important (0 pt.)	Very small importance (1pt.)	Small importance (2 pt.)	Medium importance (3 pt.)	High importance (4 pt.)	Very high Importance (5 pt.)
Timeliness of deliveries	4.43	0	1.49	0.37	9.29	31.23	57.62
Completeness of deliveries	4.37	0	0.74	0.74	10.04	37.55	50.93
Accurately of deliveries	4.36	0	0.74	0.74	13.75	36.43	48.33
Promptness of deliveries	4.31	0	1.49	2.97	13.75	40.52	41.26
Keeping the commitment	4.24	0	0.74	1.49	15.24	26.39	56.13
Accurately invoiced	4.17	0	1.12	0.74	22.68	41.26	34.20
Flexibility of deliveries	4.07	0	1.49	2.23	14.50	46.10	35.69
Transportations conditions	4.05	0	1.49	3.35	16.36	46.47	32.34
Terminal conditions	3.87	0	0.74	2.97	26.02	48.70	21.56
Complexity of services	3.78	0	4.46	5.58	31.23	36.80	21.93
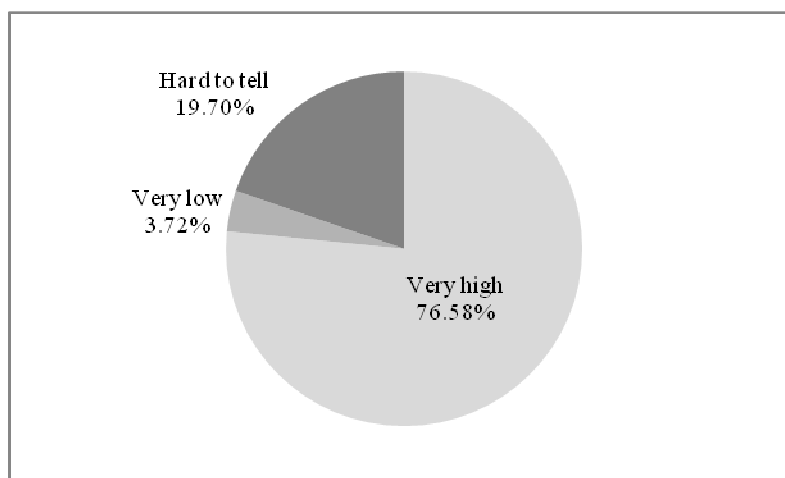
Source: Own research

Fig. 1. Satisfaction level from logistics services quality in refrigerated transport (% of indication)
Rys. 1. Poziom satysfakcji z jakości świadczonych usług logistycznych w zakresie transportu chłodniczego (% wskazań)

It was essential, to get to know the opinion of logistics purchasers about satisfaction level from logistics services quality. Results of evaluation logistics purchasers' satisfaction were announced in figure 1.

On the basis of research results it was affirmed that most respondents is pleased with quality level from logistics services. Only 4% of respondents is not pleased with quality level from logistics services and almost 20% from among them is not decided and unequivocally cannot describe quality level from logistics

services in refrigerated transport area. It can be provided that customers do not attach importance to quality provided logistics services in refrigerated transport area, what is unlikely or they do not possess sufficient of knowledge in this area.

Relation between satisfaction level and evaluation of an importance of a feature of logistic service was announced in table 2.

Table 2. Relation between evaluation of satisfaction from logistics services quality in refrigerated transport area on evaluation of an importance of a feature of logistic service influencing customer satisfaction from service quality
Tabela 2. Zależność oceny poziomu satysfakcji z jakości świadczonych usług logistycznych w zakresie transportu chłodniczego od oceny ważności cech usługi logistycznej wpływających na satysfakcję klienta w zakresie jakości usługi

Features of logistic service	Level of satisfaction
	Value of correlation coefficient r
Timeliness of deliveries	0.72
Completeness of deliveries	0.69
Promptness of deliveries	0.63
Accurately of deliveries	0.63
Flexibility of deliveries	0.46
Keeping the commitment	0.61
Transportations conditions	0.49
Terminal conditions	0.38
Accurately invoiced	0.51
Complexity of services	0.48

Source: Own research.

Table 3. Summary of multiple regression between satisfaction from logistics services quality in refrigerated transport and evaluation of an importance of a feature of logistic service influencing customer satisfaction from service quality after elimination meeting commitments and complexity services
Tabela 3. Podsumowanie regresji wielorakiej pomiędzy satysfakcją z jakości świadczonych usług logistycznych w zakresie transportu chłodniczego, a ważnością cech usługi logistycznej wpływających na satysfakcję klienta w zakresie jakości usługi po wyeliminowaniu pełnego dotrzymywania zobowiązań i kompleksowości usług

Features of logistic service and absolute term	Summary of multiple regression: R=0.75; R^2=0.56; F=114.06; p<0.0000; standard forecast of estimation =0.69					
	Beta	Standard forecast Beta	B	Standard forecast B	t(265)	p
Timeliness of deliveries	0.348621	0.083527	0.456080	0.109273	4.173762	0.000041
Completeness of deliveries	0.258133	0.075906	0.356147	0.104728	3.400697	0.000776
Accurately of deliveries	0.212475	0.059133	0.261718	0.072837	3.593180	0.000389
Absolute term			-0.253567	0.261105	-0.971129	0.332370

Source: Own research.

On the basis of results announced in table 2 it was shown strong connection between evaluation of satisfaction from logistics services quality in refrigerated transport area and evaluation of an importance in case of five features logistic services influencing customer satisfaction from service quality: timeliness of deliveries, promptness of deliveries,

completeness of deliveries, accurately of deliveries and keeping the commitment (r>0,5). However in case of timeliness of deliveries value of coefficient r is the highest, also it can be hint that this feature to a largest extent influence on level of satisfaction from logistics services quality. Moreover in case of all features of logistics services value of coefficient r assumes the positive value. Furthermore for all the attributes of logistics service a correlation coefficient is positive which means that the higher the evaluation of the importance of the feature of logistic service influencing customer satisfaction from service quality the greater the evaluation of customer satisfaction level from logistics services quality in refrigerated transport area.

As a result of estimation of multiple linear regression obtained satisfactory of the customer satisfaction of the quality of the logistic services provided in refrigerated transport area including essential statistical features of logistic service from service quality, what was shown in table 3.

Statistical analysis forward stepwise regression method showed that model did not get five following features of logistics services: promptness of deliveries, accurately invoiced, flexibility of deliveries, terminal conditions and transportations conditions. Moreover it was affirmed that essentials statistical features of logistics services influencing customer satisfaction from service quality are: timeliness of deliveries, completeness of deliveries and accurately of deliveries. On the basis of this it was affirmed that the company provides logistics services at the highest level, the level of satisfaction from logistics services quality in refrigerated transport area is higher, what the value of coefficient r really shows.

On the basis of coefficient of determination (R^2=0.56) it was affirmed that consideration essential statistical features of logistics services enables to reveal about 60% original changeability level of customer satisfaction from service quality in refrigerated transport area. In case of forecast level of customer satisfaction on the basis of regression model forecast error would be equal about 0.7.

Obtained model of the customer satisfaction of the quality of the logistic services provided in refrigerated transport area to assume following form is:

$$Y = 0.46x_1 + 0.36 x_2 + 0.26 x_3 - 0.25$$

where: Y means forecast (on the basis of model) evaluation of customer satisfaction from quality logistics services in refrigerated transport area,

x_1 - timeliness of deliveries,
x_2 - completeness of deliveries,
x_3 - accurately of deliveries,
$x_1, …, x_3$ (value of evaluation)={0,1,2,3,4,5 pt.}.

On the basis of model of evaluation customer satisfaction from quality logistics services it can describe profile levels of satisfaction originally change of level in case of higher of evaluations two of three criteria. Then profile levels of satisfaction will be following:

− if evaluation Y is less than 0.83 pt. - lack of satisfaction,
− if evaluation Y is equal or greater than 0.83 pt., and less than 1.5 pt. then - level of satisfaction is very low,
− if evaluation Y is equal or greater than 1.5 pt. and less than 2.53 pt. then - level of satisfaction is low,
− if evaluation Y is equal or greater than 2.53 pt., and less than 3.61 pt. - level of satisfaction is medium,
− if evaluation Y is equal or greater than 3.61 pt., and less than 4.69 pt. - level of satisfaction is high,
− if evaluation Y is equal or greater than 4.69 pt. - level of satisfaction is very high.

On the basis of this model it was described profile five levels of customer satisfaction as well as it was proposed for each value of evaluation each of quality criteria (from 5 to 0 pt.) appropriate value of logistics measure [Kisperska-Moroń 2006].

The analysis of case studies as well as analysis of evaluation customer satisfaction feeling from quality services provided and appointed basis of propose model was pleased

for positive evaluation of usefulness model of evaluation satisfaction [Gajewska 2012].

SUMMARY

The conducted research and statistical analysis results were pleased to propose an evaluation model of the customer satisfaction of the quality of the logistic services provided. In propose an evaluation model of the customer satisfaction of the quality of the logistic services provided in refrigerated transport was considered more important criteria of evaluation quality services such as: timeliness of deliveries, completeness of deliveries and accurately of deliveries.

Usefulness this model consist in possibility take a simple and buick comparative of researches basis of more important three qualitative criteria, taking different their importance into consideration and classification of evaluation customer satisfaction to specific level.

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SATYSFAKCJA KLIENTA Z JAKOŚCI NABYWANYCH USŁUG LOGISTYCZNYCH

STRESZCZENIE. **Wstęp:** Usługi logistyczne oceniane są przede wszystkim poprzez pomiar satysfakcji klienta. Pomiar satysfakcji dostarcza informacji na temat działania organizacji i efektywnego zaspokojenia potrzeb klientów. Celem niniejszej pracy jest zaproponowanie modelu oceny satysfakcji klienta z jakości świadczonych usług logistycznych. Podjęte badania dotyczyły oceny poziomu satysfakcji klienta z jakości usług oraz ważności dziesięciu cech usługi logistycznej wpływających na satysfakcję klienta w powyższym zakresie.

Metody: Badania przeprowadzono w oparciu o opracowany kwestionariusz ankiety badawczej skierowanej do nabywców usług logistycznych. Podmiotami badań były przedsiębiorstwa korzystające z usług w zakresie transportu chłodniczego. W celu określenia zależności pomiędzy poziomem satysfakcji klienta z jakości usługi, a cechami usługi logistycznej wpływającymi na tą satysfakcję wykorzystano korelację liniową Pearsona. Natomiast do zbudowania modelu oceny satysfakcji klienta z jakości świadczonych usług zastosowano moduł regresji wielorakiej oraz metodę krokową postępującą.

Wnioski: Zaproponowany model oceny satysfakcji klientów z jakości nabywanych usług logistycznych w zakresie transportu chłodniczego oraz wyznaczenie charakterystyki poziomów tej satysfakcji zostały pozytywnie zweryfikowane w wyniku przeprowadzonych następnie badań empirycznych.

Słowa kluczowe: jakość, satysfakcja klientów, usługi logistyczne, transport chłodniczy

DIE ZUFRIEDENHEIT DES KUNDEN MIT DER QUALITÄT LOGISTISCHER DIENSTLEISTUNGEN

ZUSAMMENFASSUNG. Einleitung: Die Dienstleistungen in der Logistik werden in erster Linie mit Hilfe der Messung der Befriedigung von Bedürfnissen und der Zufriedenheit der Kundenschaft eingeschätzt, was direkte Informationen über die Kondition der Organisation und die effektive Befriedigung der Kundenbedürfnisse liefert. Das Ziel dieses Konzepts ist die Modellierung der Bewertung der Zufriedenheit der Kunden auf der Basis der Qualität der geleisteten logistischen Dienstleistungen zu empfehlen.

Methoden: Die durchgeführten Forschungen haben die Einschätzung des Grades der Zufriedenheit des Kunden aus der Perspektive der Qualität der Dienstleistungen bestätigt, und dies bei der Berücksichtigung der Sonderbedeutung und der Relevanz von 10 Kerneigenschaften der logistischen Dienstleistung, die auf die Zufriedenheit des Kunden im obigen Umfang einen enormen Einfluss ausüben. Die Forschungen wurden in Anlehnung an eine Forschungsumfrage, die an die Erwerber der logistischen Dienstleistungen gerichtet worden sind, konzipiert. Die Subjekte der Untersuchung bildeten die Unternehmen, die logistische Dienstleistungen im Bereich des Kühltransports anbieten.

Ergebnisse: Um die Zusammenhänge zwischen dem Grad der Zufriedenheit des Kunden in Anbetracht der Qualität der Dienstleistung sowie die Eigenschaften der logistischen Dienstleistung, die auf diese Zufriedenheit einen Einfluss haben, zu bestimmen, hat man die Pearson-Korrelationsformel benutzt. Um das Modell der Bewertung der Zufriedenheit des Kunden mit der Qualität der geleisteten Dienstleistungen korrekt zu errichten, wurden die Multiple Regression und die progressive Segmentmethode eingesetzt.

Fazit: Das empfohlene Modell der Bewertung der Zufriedenheit bei den Kunden mit der Qualität der erworbenen logistischen Dienstleistungen im Bereich des Kühltransports und die Bestimmung der Charakteristik des Grades dieser Zufriedenheit wurden infolge der dann durchgeführten empirischen Forschungen überprüft und als positiv eingeschätzt.

Codewörter: die Qualität, die Zufriedenheit der Klientel, logistische Dienstleistungen, der Kühltransport

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