

# The impact of innovativeness of logistics service providers on their relationships with customers

## *Wpływ innowacji na kształtowanie się relacji usługodawców logistycznych z klientami*

The purpose of this paper is to investigate whether there is an impact of innovativeness of logistics service providers on their relationships with customers. In the studies we identified five types of innovation, namely: product, process (including IT innovations), marketing communications, organisation and CSR one, and compared the strength of the impact of each of them. To ensure high-quality studies, except the traditional one-side view we exploited the data triangulation method, which consisted in the collection of opinions of both parties to the relation, i.e. the LSPs and the customers. The research covered 55 logistics service providers and 101 production or trading companies. The general findings show significant, although diversified importance of particular types of innovation in the process of building long-term logistics partnership. According to the results the product innovations are the most influential.

### **Słowa kluczowe:**

innovations, innovativeness, logistics service providers, relationships in supply chain.

Artykuł przedstawia wyniki badań nakierowanych na ustalenie wpływu innowacji usługodawców logistycznych na ich relacje z klientami. W badaniach wyróżniono pięć rodzajów innowacji, tj.: produktowe, procesowe (w tym informatyczne), dotyczące komunikacji marketingowej, organizacyjne oraz CSR i porównano siłę wpływu każdego z nich na wspomniane relacje. Dla zapewnienia wysokiej jakości badań zastosowano metodę triangulacji danych, która polegała na zebraniu opinii obydwu stron relacji, czyli usługodawców oraz ich klientów. Próby badawcze liczyły odpowiednio: 55 usługodawców logistycznych oraz 101 przedsiębiorstw zajmujących się produkcją lub handlem. Uzyskane w toku badań wyniki dowodzą dużego, choć zróżnicowanego znaczenia poszczególnych rodzajów innowacji w budowaniu długotrwałego partnerstwa logistycznego (największe znaczenie mają innowacje produktowe).

### **Key words:**

innowacje, innowacyjność, usługodawcy logistyczni, relacje w łańcuchu dostaw.

## Introduction

In this paper we will be looking for a connection between relationships in the supply chain and innovativeness of the logistics service providers. It is true that in the literature on supply chains these issues are usually discussed separately, but some authors do notice connections existing between them. Wagner and Sutter (2012) underline for example the need to analyse a connection between the innovative activities undertaken by logistics service providers and innovativeness of their customers. Also Bellingkrodt and Wallenburg (2013) examine a connection between interorganisational relationships and decisions of service providers to implement an innovation. On the other hand Panayides and So (2005) prove the existence of a positive dependence between innovativeness, relational ability and the efficiency of the supply chain. A similar position is presented by Cui, Su

and Hertz (2012), who are convinced about the importance of innovations in relationships with the customers. On the other hand Soosay, Hyland and Ferrer (2008) indicate various methods of integration of the enterprise with customers and suppliers in the supply chain, concluding that cooperation based on partnership relations has a positive impact on the innovations implemented in the supply chain.

Basing on the above findings, we have decided to examine a connection between innovativeness of the LSPs and their relationships with other participants of the supply chain. However, we focused on the opposite direction of the relationship — the impact of innovation on relationships in the supply chain. In our opinion, the innovativeness of LSPs is conducive to the achievement of advanced levels of cooperation with the customers. All parties to the relationship (the service provider, the supplier and the cargo consignee) can benefit from innovations implemented

by the LSPs. This point of view is shared by Panayides and So (2005), who, referring to their studies, admit that innovations implemented in the supply chain can have a significant impact on the strengthening of the relationships between LSPs and their customers.

## Literature review

### Relationships between LSPs and customers

In the literature on the supply chain management, the term „relationships” is understood as a connection or dependence which exists between at least two participants of the supply chain — mainly the manufacturing and trading companies, which cooperate with each other to achieve common goals in a more efficient way. Such connections (with a vertical relationship) focus on the exchange of services, i.e. arrangements relating to the sale and purchase transactions (dyadic relation) between subsequent links in the supply chain (Świerczek, 2012). A lot of research has already been conducted into this subject (Humphries and Mena, 2012; review of literature in Daugherty, 2011). However it should be noted that focusing exclusively on the study of the relationships between the manufacturing companies and trading ones seems to be appropriate for the examination of supply chains only at a low and medium level of complexity. Such approaches are known in the literature as a direct supply chain and extended supply chain, and they take into account the following elements of the chain: supplier-organisation-customer and supplier's supplier-supplier-organisation-customer-customer's customer (Mentzer et al., 2001).

So far, relatively little attention has been paid to research into relationships which can be observed on the ultimate supply chain level, i. e. higher chain complexity (Fabbe-Costes and Roussat, 2011; Niestrój, 2014). At this level, one should take into account the multi-directional relationships occurring between manufacturing and trading companies, logistics service providers, financial institutions, businesses conducting market research for a given supply chain, etc. The results of empirical studies by Wilding and Humphries, indicating a strong positive correlation (0.85) between the degree of partnership in relationships between various types of entities and effectiveness of the chain should be quoted here (Humphries and McComie, 2010).

The relationships of logistics service providers with cargo suppliers and consignees take on an increasingly more frequent basis the form of a logistic partnership (Tate, 1996). This issue becomes particularly important, because thanks to this partnership, the service provider enters into long-lasting relation-

ships with various entities in the existing structure of chain relationships. In this case, the related entities are not only the service providers and their customers, but also subsequent links of the supply and distribution sphere, i. e. the supplier's suppliers and customers of the cargo consignees. Hertz and Alfredsson (2003) emphasize the fact that the service provider, acting as an intermediary between the parties to the transaction, should see the influence of the other participants in the supply chain on the relationships that connect the service provider with the customers. This is important, because the relationships existing in the supply chain are interdependent and simultaneous, and thus one relationship is dependent on the course of another one (Gadde and Hulthén, 2009).

As emphasized by Thakkar, Deshmukh, Gupta and Shankar (2005), relationships of the logistics service provider with its customers, despite being more complex, contribute to an increased flexibility of the supply chain. Gadde and Hulthén (2009) indicate additional benefits. Based on extensive studies of the literature, the authors found that a close cooperation with the service provider could lead not only to a better understanding of the logistics outsourcing by the customers, but also to an improved efficiency of logistics services and to an increased adaptability of the service providers to the changing purchasing needs and preferences. Moreover, in the opinion of Laskowska-Rutkowska (2014) this particular type of relationship, i. e. a long-term partnership is conducive to innovativeness in logistics.

### Defining innovation from the perspective of logistics service providers

Innovativeness of the classical participants (i.e. manufacturing and trading companies) of the supply chain is also the subject of extensive research and numerous publications. Less attention is devoted to research into the innovativeness of the logistics service providers. Among the publications dealing with this subject, the papers by Busse and Wallenburg (2011), Cui, Su and Hertz (2009) or Lin (2006, 2007, 2008) can be mentioned. An interesting approach was also presented by Chaberek (2014), who introduces the concept of innovation space coupled in the supply chain. This space consists of mutual pro-innovative interactions of: product development, development of production processes and the development of logistics services. The author emphasizes the role of the development of logistics services, metaphorically considering it to be a „creative engine of innovativeness” in the supply chain.

In the case of logistics services providers, which are a relatively homogeneous group of companies as

regards the products, it seems reasonable to ease the requirement of recognizing an entity as an innovative company, on the basis of its absolute priority in the implementation of a given solution in economy. Instead, the authors propose to consider as an innovative service provider an entity which has implemented new solutions (but which may have already been known in the industry) for itself (see: Wagner, 2008). Furthermore, the innovativeness of LSP can be understood as a kind of measurement contingent on an LSP's proclivity towards innovation.

According to a division proposed in the Oslo Manual (2005), four different types of innovations in the objective sense, i. e. product, process, marketing and organisation innovations can be distinguished.

Product innovations can consist in the introduction of major improvements in the manner of the provision of logistics services (for example, in increasing the efficiency and speed of services provision), in the addition of new functions or characteristics to the already existing services and above all in the introduction of entirely new services for a given service provider. Process innovations are implementations of a new or considerably improved method of the provision of logistic services. These methods may include significant changes or the introduction of new technologies, equipment, software, as well as new procedures used in the implementation of logistic processes. Marketing innovations include changes raising the value of the offer in the eyes of the customers, as well as changes in the distribution, promotion or pricing strategy, provided that they are part of a new concept or marketing strategy, which differs from marketing methods used so far. In the case of logistics services providers, this kind of innovation may include for example: social media marketing and experience marketing (Świtłała, 2013). Finally, organisational innovations are implementations of a new organisational method in the operating principles adopted by the company and in the organisation of workplaces. The point is to use an organisational method that has not been used in the company so far and which results from the strategic decisions taken by the company's management board. Organisational innovations can consist in a greater centralization or decentralization/autonomy of the activity. Innovations from this group will also include new organisational methods in relations with the surroundings, including other companies or public institutions, such as the establishment of a new type of cooperation with research institutes or customers, new methods of integration with suppliers, as well as the first outsourcing order.

In the studies, in addition to the above four groups of innovations, we identified a fifth group into which we included innovations in the field of CSR. In this case, when adding this group, we were guided by the results of studies that show a connection between

CSR and innovativeness of enterprises (Bocquet and Mothe, 2011; Pyszka, 2011). It should be underlined that the majority of LSPs not only declare involvement in socially responsible activities, but also recognize the importance of this concept for the development of their relationships with other participants of the supply chain (Kłosa and Świtłała, 2013). Implementation of this kind of innovations may be caused by both the requirements of the customers (and of other participants of the chain) who expect from their partners transparent rules of cooperation and observance of environmental and social standards, and by the desire to keep up with the competitors, applying the CSR tools.

## Quantitative data analysis methods used in the research

When analysing the research results we used the SPSS version 21.0 and Statistica version 10. In the statistical analysis we applied the following types of non-parametric tests:

- Kruskal-Wallis test — as the equivalent of a one-factor variance analysis ANOVA for three independent samples,
- chi-square independence test — to examine a connection between two variables,
- Cramer V correlation coefficients — to determine the strength of a connection between the variables (as an addition to the Chi-2 test) and rho-Spearman (as an equivalent of the r-Pearson correlation).

We have also performed a reliability analysis and standardization procedure used in the studies on the measurement scale.

## Structure of the research sample

In order to investigate the impact of innovativeness of LSPs on their relationships with customers, we conducted an exploratory study using the data triangulation method. In this case, our goal was to avoid the problem of one-sided view in relationship research, an issue that has been pointed by many authors (e.g.: Monczka, Callahan and Nichols, 1995; Hussein, 2009).

The empirical research was carried out in between 2013 and 2014. We examined a total of 156 entities, including 55 logistics service providers and 101 manufacturing and trading companies. The respondents were interviewed directly by pollsters of the Research and Expertise Centre of the University of Economics in Katowice.

The group of service providers was dominated by small and medium-sized entities operating on the international market and offering a wide range of logi-

Table 1

Distinguished groups of service providers: 2PL, 3PL and 4PL

Itemization	Type of LSPs						Statistical description		
	2PL		3PL		4PL		Chi-2	P	Multiple comparisons
	N = 20	36%	N = 14	25%	N = 21	38%			
	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$			
Number of services in the offer	3,25	2,27	6,64	2,50	9,05	2,31	29,54	0,000**	2PL-3PL = 0,011* 2PL-4PL = 0,000** 3PL-4PL = 0,142
Number of branches	1,50	1,56	4,08	5,18	9,33	16,30	4,58	0,101	—
Company size	SME (85,0%)		SME (71,4%)		SME (71,4%)		4,59	0,101	—
Geographical range	national(55,0%)		international (57,2%)		international (92,2%)		8,69	0,013*	2PL-3PL = 0,476 2PL-4PL = 0,01* 3PL-4PL = 0,639

Zródło: Opracowanie własne na podstawie

stics services ( $D = 8$ ). Their revenues came mostly from the logistics services offered to the trade sector, in particular from the provision of services to retail chains. Many service providers also offered their services to the automotive industry and the construction sector.

The second group was represented by companies using the logistics services. We investigated 50 manufacturing companies and 51 trading companies. The research sample was dominated by small and medium-sized companies operating in most cases on the regional or national level. In both cases, the respondents spent on average 10,000 PLN (approx. 2,320 EUR) a month on logistics services.

In the group of LSPs we identified three types of entities differing in competences in logistics services. Studies by Lai (2004) confirm that the competences of LSPs are reflected in the quality of the provided services and should therefore constitute an important criterion for their typology. In the conducted research we chose the type of the offered services proving the existing competencies as the criterion for the division, and we qualified the service providers into three groups: 2PL — provision of simple TSL services without a permanent contract, 3PL — customer service on the basis of contract logistics and 4PL — provision of contract logistics services and supply chain management services (4PL). In practice, the 3PL/4PL operators provide their logistics services within a global network of connections with the application of the latest IT solutions (Świtała, 2012). Table 1 presents a detailed description of the research sample in various sections.

Data included in the above table show significant differences between the examined types of enterpri-

ses. Generally — in accordance with the accepted assumption — we could state that a higher class of service providers means better competences in the provision of logistics services. As regards the scope of the provided services, the difference between 2PL and 4PL is highly statistically significant, and the difference between 2PL and 3PL is statistically significant. It also turns out that the 4PL operators offer a much wider range of services, compared to 2PL service providers ( $p = 0.01^*$ ). We also perceived the huge differences between the 3PL and 4PL operators, although in this case they are not statistically significant.

## Empirical findings

### Classification of service providers based on the level of innovative activity

To assess the level of innovativeness of logistics services providers we used a summary scale, which takes into account the number of implemented innovations. For the test we pre-selected 34 variables which met the requirement of the occurrence of innovation. The measurements were performed using binary nominal scales with answers „yes/no”. Questions from the questionnaire concerned:

- new services available in the offer,
- new and implemented process improvements (including IT)
- new marketing methods,
- new methods in organisation management (with an identification of a separate CSR area).

All items in the scale were subjected to homogeneity analysis, on the basis of which 9 „unfitting” items were removed from the study. Their elimination contributed to an increase in the value of the coefficient  $\alpha$  from 0.594 (34 of items) to 0.703 (25 items). A scale formed this way was subjected to the normalization process with the use of the sten scale with the average ( $\bar{x}$ ) = 5.5 and standard deviation ( $\delta$ ) = 2.0. Each sten (equalling to 0.5 of the standard deviation) corresponds to a certain percentage of an area under the normal distribution curve (Brzeziński, 2003): sten 1 [0.000–0.023] sten 2 [0.024–0.067] sten 3 [0.068–0.159] sten 4 [0.160–0.308], sten 5 [0.309–0.500] sten 6 [0.501–0.692] sten 7 [0.693–0.841] sten 8 [0.842–0.933] sten 9 [0.934–0.977] sten 10 [0.978–1.000]. A procedure for the development of sten standards for the new scale is shown in Table 2.

The first group consisting of 19 service providers included companies with little innovation activity (stems 1–4). The research shows that over the past two years the respondents from this group have implemented a total of 39 innovations, on average two new implementations per company, involving in most cases marketing and organisational issues. The next group was characterized by an average level of innovation (stems 5–6). It is made up of 19 entities, which on average implemented 6 innovations each. In this group, the main attention was focused on three types of innovations: organisational, marketing and product ones. A high level of innovation activity (stems 7–10) was observed in 17 analysed cases. Mostly 4PL operators with foreign capital turned out to be innovation leaders. In this case, a total of 175 innovations

were implemented. On average, each company invested in more than 10 new products. Also in this group the most frequent type of the implemented innovations were the organisational and marketing ones.

### Impact of innovations on the development of relationships with customers — opinion of logistics services providers

The test results showed a positive correlation between the level of innovativeness of the respondents and their belief in the impact of innovations on logistics cooperation. In this case, we found a statistically significant impact on the level of 0.05\*, with the Spearman's rho amounting to 0.329. This means that an increase in the number of implemented innovations results in an increased willingness of managers to express a positive opinion on the role played by innovations in building relationships with customers. We also noted that the less active service providers preferred more often neutral or negative responses. On the one hand, this can be explained by a lack of experience in the implementation of innovative projects, on the other hand — by unsatisfactory effects of the implemented innovations.

The test results presented in Table 3 show the existence of differences in the views of respondents on the impact of innovations on their existing relationships with customers. The prevailing view among the respondents is that their relationships with customers have improved considerably thanks to product innovations.

Table 2  
Sten norms for the innovation scale

Raw result (1)	N (2)	N CUM (3)	N CUM/55 (4)	Sten (5)	Innovative activity level (6)
0	3	3	0,055	1	low
1	3	6	0,109	2	
2	3	9	0,164	3	
3	10	19	0,345	4	
4	1	20	0,364	5	average
5	4	24	0,436		
6	10	34	0,618		
7	4	38	0,691	6	
8	3	41	0,745		
9	4	45	0,818	7	
10	1	46	0,836		
11	6	52	0,945	8	
12	1	53	0,964		
13	1	54	0,982	9	
14	1	55	1,000		

Source: Own elaboration.

Table 3

Impact of innovations on the relationships with customers in the opinion of the analysed companies

The relationships with customers have improved considerably thanks to	$\bar{x}$	$\delta$	1	2	3	4	5	Total
			I strongly disagree	I disagree	I don't agree and I don't disagree	I agree	I strongly agree	
			%					
product innovations	4,02	0,76	0,0	3,6	16,4	54,5	25,5	100,0
process innovations	3,50	1,18	7,3	10,9	29,1	29,1	23,6	100,0
marketing innovations	3,40	1,09	7,3	12,7	25,5	41,8	12,7	100,0
organisational innovations	3,29	1,12	5,5	18,2	34,5	25,5	16,4	100,0
innovations related to CSR	2,58	1,23	23,6	25,5	27,3	16,4	7,3	100,0

Source: Own elaboration.

It should be noted that most respondents have chosen answer 4, which means that they preferred positive answers. The obtained results also show the greatest compactness, as evidenced by the lowest standard deviation ( $\delta = 0.76$ ). A positive effect, although expressed in a less convincing way, is also attributed by the respondents to process, organisational and marketing innovations. It is worth noting that over half of them see a possible application of new process and organisational solutions in cooperation with customers, as well as the benefits ensuing from the application of modern marketing instruments. Compared to product innovations, we recorded a much higher percentage of negative responses: in the case of process innovations the negative responses constituted 18.2%, in the case of marketing innovations — 20.0%, and in the case of organisational innovations even 23.7%. We also observed a clear dispersion of results in the views expressed on organisational innovations and those concerning CSR. In the first case we perceived that the respondents found it difficult to assess the impact of organisational

innovations on their business relationships, in the second case — we could see a failure to recognise the benefits resulting from the implementation of the CSR principles (as many as three quarters of the respondents deny or does not confirm that the CSR activities translate into improving the relationships with customers). The respondents' opinions suggest that many companies do not implement the idea of corporate social responsibility or do not consider activities undertaken in this area as profitable.

#### Impact of innovations on the development of relationships with logistics service providers — opinion of the customers

To analyse whether both parties similarly perceived the impact of innovations on cooperation, we compared the above results with assessments made by logistics service recipients. The research sample included manufacturing and trading companies (separately). The table 4 shows a summary of average assessments for all five types of innovations. A high-

Table 4

Assessment of the impact of innovations of the logistics service providers on the relationships with customers — comparative breakdown of mean assessments.

Itemisation	Product innovations		Process innovations		Marketing innovations		Organisational innovations		Innovations related to CSR	
	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$
KW-H (2;156) p	12,4384 0,0020**		0,2331 0,8900		2,7599 0,2516		0,2765 0,8709		2,5539 0,2789	
Research samples:	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$	$\bar{x}$	$\delta$
LSPs	4,02	0,76	3,51	1,18	3,40	1,10	3,29	1,12	2,58	1,23
Manufacturing companies	3,50	1,04	3,42	1,16	3,22	0,97	3,20	1,05	2,90	1,20
Trading companies	3,41	1,06	3,45	1,22	3,14	0,98	3,24	1,07	2,86	1,02

Note: Rating scale as in table 3.

Source: Own elaboration.

ly statistically significant difference of the average assessment of the service providers and the customers can only be seen in the case of product innovations (KW-H = 12.4384, p = 0.002). The customers see a positive impact of these innovations on the development of the cooperation, however they are not as convinced in this matter as the logistics service providers are (they assess the impact as comparable to the effect of process innovations). It should be added that the diversity of assessments by the customers is significantly higher than in the group of service providers.

### Position of the analysed service providers in relationships with customers

Attachment of more importance to product innovations may be indicative of a generally weaker position of the service providers in the mutual long-term relationships with customers or in a transaction cooperation. A vast majority of the respondents, while declaring a willingness to maintain a satisfactory cooperation with the customers by expanding their product offer, expect to win new customers thanks to it. This applies to both service providers from the 2PL group, as well as more advanced: 3PL and 4PL. Only 21-29% of the respondents, depending on the type of the service provider, declare that product innovations are aimed only at maintaining relationships with the present customers (Table 5).

## Conclusions

The research, in accordance with the adopted assumptions, focused on assessing the impact of innovativeness of logistics service providers on the relationships between them and their customers. The conducted studies enabled us to collect a wide range of data. In the course of data analysis, we classified service providers based on the scope of the services provided by them and distinguished 3 classes differing between each other in the level of innovation activity, i. e. companies with little, average and high innovation activity. At this point it is worth noting that 4PL providers turned out to be innovation leaders. Next, we analysed the impact of innovations on the relationships with customers and determined the reasons for innovations.

The results obtained in the course of the research allowed us to confirm that innovative managers were likely to attribute to innovativeness a stimulating role in the development of relationships with customers, while this belief was the most express and consistent one in terms of product innovations. In this case it is worth noting that LSPs are more convinced about the impact of product innovations on the relationships, than the customers, and the difference in the assessment is statistically significant. Perhaps service providers are convinced that by extending their offer, they will strengthen their position in relationships with the customers, giving them no excuse to

Table 5

Declared purpose of the changes in the offer of the analysed service providers

Itemisation		Changes in the offer (in %)		
		Aiming at winning new customers	Aiming at maintaining cooperation with the customers	Aiming at winning new customers and simultaneous maintaining cooperation with the customers
Type of LSPs	2PL	5,0	25,0	70,0
	3PL	14,0	21,0	64,0
	4PL	19,0	29,0	52,0

Source: Own elaboration.

This leads to the conclusion that a majority of the analysed service providers are rather willing to „secure” a possibility of offering services to a wider range of customers, remaining with them at lower cooperation levels, than to focus on a small number of selected customers, trying to establish a symbiotic relationship. There is however a certain group of service providers, mostly among 4PL, which can build such a relationship; this will however depend on the intentions of the served customers.

look for other service providers, if the customers need change. On the other hand, service providers recognize the fact that a wide range of services reduces their risk, enabling them to service more customers, which shows an asymmetry in the mutual relationships. In the case of the remaining four groups of innovations, the customers' opinions do not differ from the opinions of the service providers.

Summarizing the results of the research, we can reach, with a certain level of caution, the following conclusion: implementation of innovations is condu-

cive to entering into higher levels of logistics cooperation, and the surveyed service providers are aware of this fact. However, these higher levels of cooperation are achievable only with the support of the customers, which is not general. Only the major market players, in this case, the 4PL providers, are able to persuade their customers into adopting such an attitude or to create it — by, among others, their above-average innovation activity.

## Limitations and further research

The presented research results are subject to certain limitations that can be considered in two planes: methodological and cognitive one. The methodological limitation is the research sample (see „Typical sample sizes for studies of institutional populations” in Churchill, 1995), that is made up of a sufficient, but not very large group of logistics service providers operating in logistics service market, especially in comparison with the number of manufacturing and trading companies, usually analysed in terms of relationships and innovativeness. When formulating research conclusions, one runs the risk of over-interpretation of the obtained results due to a small representativeness of the research sample. This problem is particularly important in the case of the division into three subsets of LSPs based on the criterion of innovativeness.

The next issue concerns the objective asymmetry of the conducted studies. Although the study covered the population of customers, the article mainly focused on the presentation of the opinions of logistics

service providers. Thus, the viewpoint of the other party to the relationships remains an area which was only partially explored.

In our opinion, the results presented here should motivate for more in-depth research on the issues dealt with in the article. Tracking changes in the supply chain under the influence of innovative logistics solutions seems to be an interesting area of research. In this respect it is not only important to perform the measurements in a cyclical manner, but also to control alternative explanations (see Kleczek, 2012). It is interesting to examine whether the activity of innovative logistics service providers is sufficient for building new forms of cooperation with customers, e. g. with respect to the four models of relationships by Halldorsson and Skjott-Larsen (2004). A analysis of the connection occurring between innovativeness of the service providers and their position in the supply chain also should be performed in the future. In this respect the impact of other variables, e. g. the extent to which the already mentioned level of logistics cooperation affects the role performed by the service providers in the supply chain should be determined. On the other hand, it should be noted that innovations implemented by service providers are only one of many determinants of the level of cooperation with customers. For example Leahy, Murphy and Poist (1995) give as many as 25 elements which have an impact on the satisfaction with the existing relationships. In the subsequent studies, the research efforts should focus on the verification of the extent to which factors other than innovations may have an impact (stimulatory or toned one) on the relationships in the supply chain.

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