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ANALYSIS OF THE IMPORTANCE OF CRITERIA IN CARRIER SELECTION

Summary: The author made an attempt to verify, quoted in the expert literature, the recommendations devoted to the selection of a unit which provides transport services. The basis for the present study is a survey which main task is to identify the key criteria of carrier selection. The above mentioned survey was inspired by papers of Coyl, Bardy, and Langley. Following the results of the survey we can come to several conclusions. There can be observed a connection between the choice of criteria and the expectation of the environment in which the selection is carried, as well as the change of preferences of carrier selection in the last few years.

Key words: logistics, carrier selection, supply chain management.

Today's business environment differs a lot from the one in some years from now. The dynamics of production growth, the exchange of information, and the availability of products are changing rapidly. For many enterprises local markets are too small. That is why they look for different markets all over the world. Competition is getting stronger, consequently clients can choose from products offered by different brands and with similar qualities. The availability of a product and its price are crucial factors. It is very common that companies have their branches and agencies all over the world; they design in one country, manufacture their goods in another, and their market is worldwide. As the chains of supply are getting longer in global economy, transport is becoming more and more important, as it is a link between a seller and a buyer. But for the increasing gap between the elements of the chain of supply managers would consider that one of the most important criteria, which increases the competitiveness of the offer of their company, is well organized transport. The quality of a transport service has an impact on: the performance of every object of the logistics network, the demand for the company's products, and other costs connected with storage and warehousing of goods.

The selection of a carrier is a specific example of the process of purchase through which an enterprise gains a service, and directly influences the performance of the logistics and supply chain. The impact of the transport on the work of an enterprise indicates that the selection of a proper carrier becomes one of crucial decisions [Cooper, Lambert, Pagh 1997, p. 8]. The selection is a two stage process. The first stage is a decision which branch of transport a given company is going to choose. This decision is determined by various factors, and should be made according to

individual needs of the enterprise. A proper infrastructure, type of products to be delivered, and the size of the delivery are some of the most important factors to be considered by an enterprise. Motor transport is the most popular in Poland. This situation is mainly caused by a weak position of other branches of transport on the Polish market as they are not competitive for motor transport, as far as time and prices are concerned.

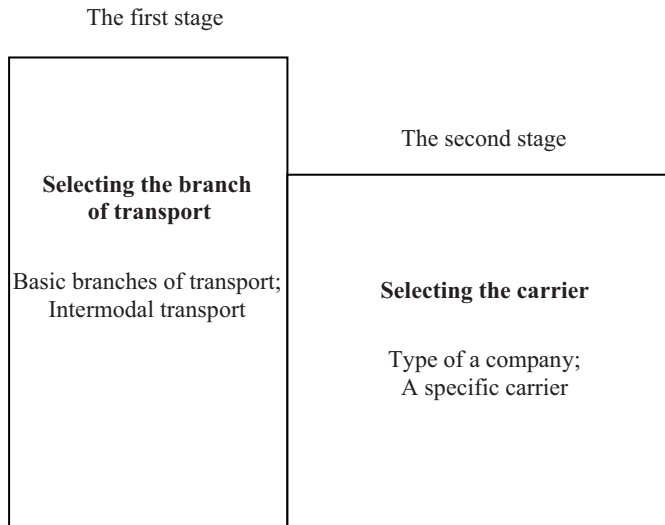


Fig. 1. Stages of selecting a carrier

Source: [Coyle, Bardi, Langley 2002, p. 407].

The choice of a carrier is the second stage. At this point a given enterprise has more possibilities than in the first stage, that is why the criteria of selection become very important factors. In the primary sources [Kent, Parker 1999, p. 398-408; Spencer, Rogers 1994, p. 60-74; Utecht, Suttle, Tullous 2005, p. 27-33; Menon 1998, p. 121-136; Coyle, Bardi, Langley 2002, p. 408] costs and the quality of service are the most often mentioned decisive factors of selecting a carrier.

Scientists, who chart the development of logistics and its influence on the performance of a company, do a lot of research aiming at distinguishing the most distinctive criteria of service selection. As a result of their work numerous ranking lists are generated, which present the most important criteria that a transport engineer should follow in order to evaluate the offer of a given carrier.

A research, held in 1989 and published in "Transportation Journal" by E.J. Bardi, P. Bagchi, and T.S. Raghmutan, allows to differentiate the precise criteria of a carrier selection recommended on the American market.

Table 1. Criteria of a carrier selection

Criterion	Standing in American qualification
1. Reliability and regularity of the time of delivery	1
2. Shipping fees and the costs of transportation “from door to door”	2
3. Total time of delivery in “the door to door” mode	3
4. Willingness to negotiate the shipment fees	4
5. Financial stability of a carrier	5
6. Availability of the equipment	6
7. Frequency of a service	7
8. Services of direct receipt and delivery	8
9. Loss or damaging of the delivery	9
10. Preparation of the shipment	10
11. Staff qualifications	11
12. Shipment’s monitoring	12
13. Willingness to negotiate the level of service	13
14. Flexibility in preparing timetables	14
15. Services connected with towing	15
16. Claims	16
17. Carrier’s trading skills	17
18. Special equipment	18

Source: [Bagchi, Raghunathan 1989, p. 4-11].

Those results, published in “Transportation Journal”, enable us to carry out a similar research on the Polish market. Gaining data, which abovementioned criteria are the most important for the companies in Poland, could be a major objective. Such an investigation was accomplished in the group of 134 people, representatives of the army, as well as producing, trading, and distributing companies. Every respondent:

1. Had to specify, at the most, five categorical criteria, meaning those for which exact requirements are created.

2. Could specify, at the most, three reference criteria which accomplishment increases chances of a carrier to be given commission for delivering goods.

3. Could specify, at the most, two enriching criteria which are seen as advantage of a given carrier, but do not play any important role when an enterprise selects a carrier.

Above given rules are designed so as to oblige the questioned people to specify the elements without which a transportation service could not be possible. The results of the research are presented in table number 2. The names of the criteria and values ascribed to them are placed in given columns in relation to the numbers of indicating categorical criterion, which are organized in descending order.

In the column “categorical criterion – % of indications“ the five most important categorical criteria are in bold. In the next column (reference criterion – % of indications) the four most important criteria are in bold. In the same way two the most valued criteria in the third column (enriching criterion – of indications) are organized.

Table 2. Itemization of criteria for decisive factors of a carrier selection for every enterprise taking part in the survey

No	Name of the criterion	Categorical criterion		Reference criterion		Enriching criterion		% of not indicating
		number	% of indications	number	% of indications	number	% of indications	
1	Reliability and regularity of the delivery time	122	91	5	4	4	3	2
3	Total time of delivery in “door to door” mode	71	53	21	16	12	9	22
2	Shipping fees and the costs of transportation “from door to door”	64	48	26	19	13	10	23
9	Loss or damage of the delivery	56	42	32	24	11	8	26
6	Availability of the equipment	53	40	32	24	19	14	22
12	Shipment’s monitoring	48	36	35	26	19	14	24
7	Frequency of a service	41	31	30	22	14	10	37
8	Services of direct receipt and delivery	35	26	22	16	20	15	43
14	Flexibility in preparing timetables	29	22	24	18	28	21	40
4	Willingness to negotiate the shipment fees	25	19	37	28	11	8	46
18	Special equipment	25	19	13	10	43	32	40
11	Staff qualifications	24	18	20	15	28	21	46
5	Financial stability of a carrier	23	17	25	19	24	18	46
16	Claims	17	13	14	10	30	22	54
13	Willingness to negotiate the level of service	12	9	21	16	19	14	61
10	Preparation of the shipment	11	8	14	10	54	40	41
17	Carrier’s trading skills	1	1	6	4	57	43	52
15	Services connected with towing	0	0	4	3	66	49	48

Source: own elaboration on the basis of the survey held by S. Krawczyk.

Just like in the study of American scientists the first place of “Reliability and regularity of the delivery time” is of much importance. This criterion was indicated by 91% of respondents. This decisive factor is definitely more important to Polish managers than “Shipment fees and the costs of transportation from door-to-door” which is third, and in American research it came second.

In the first five criteria categorically demanded from a carrier, four are directly connected with reliability and solidity of delivery. These are: “Reliability and regularity of the delivery time,” “Total time of delivery in door to door mode – second”, and “Loss or damage of the delivery” and “Availability of the equipment” which are fourth and fifth accordingly. The high number of indications to the criterion “Loss or damage of the delivery” is very surprising. In American research this decisive factor was only at the ninth place.

Categorical criteria are supplemented by reference criteria. Measures like: “Loss or damage of the delivery” and “Availability of the equipment” are indicated by respondents both in categorical and reference criteria. Adding to it “Willingness to negotiate shipping fees” and “Shipment’s monitoring” we have got a set of four reference criteria which fulfillment by a carrier increases the odds of getting a commission for delivering goods. The results prove that elements connected with quality, punctuality, and frequency of deliveries have a major place in the category of referential measures. The presence of “Willingness to negotiate shipment fees” among reference criteria focuses our attention. Its place is a kind of surprise. Discrepancies between results obtained by American and Polish scholars can make us wonder. In Poland this criteria is at the distant 10th place among categorical criteria. It’s importance is valued among referential criteria. In the USA this element is much more significant as it is in the fourth place among eighteen criteria.

The results of the research for enriching criteria are very surprising. The fact that as many as 49% of indications were to the criterion: “Services connected with towing” and 43% of indications were to the criterion: “Carrier’s trading skills” cast a doubt whether those criteria were properly understood by respondents. In American research those measures came at the bottom of the list, on the other hand their usefulness was appreciated in Poland. Analyzing the results for each criterion we can come to a conclusion that there is a high percentage of not specifying some of them at all. There may be two reasons for this fact, the first is that some of the criteria were not understood, and the second that the rule which allows to specify only a limited number of elements was not suitable. The very high position of the criteria connected with punctuality and quality of service is an obvious indicator for the carriers that in competing for getting commissions they need to concentrate on the time and the quality of provided service. Quality and punctuality are leading measures among categorical and reference criteria.

Apart from analyzing the preferences of all companies, more detailed research was carried out; concerning mentioned earlier criteria, in the three types of companies: producing, trading, service and the army. This research should be seen as an

Table 3. Producing companies – criteria for carrier selection

No	Name of the criterion	Categorical criterion		Reference criterion		Enriching criterion		% of non indicating
		number	% of indications	number	% of indications	number	% of indications	
1	Reliability and regularity of the delivery time	62	95	1	2	0	0	3
3	Total time of delivery in “door to door” mode	40	62	7	11	3	5	23
2	Shipping fees and the costs of transportation “from door to door”	32	49	15	23	4	6	22
6	Availability of the equipment	31	48	14	22	7	11	20
9	Loss or damage of the delivery	26	40	20	31	2	3	26
12	Shipment’s monitoring	20	31	23	35	6	9	25
7	Frequency of a service	19	29	19	29	7	11	31
14	Flexibility in preparing timetables	19	29	14	22	12	18	31
8	Services of direct receipt and delivery	16	25	10	15	10	15	45
5	Financial stability of a carrier	11	17	11	17	10	15	51
18	Special equipment	11	17	2	3	24	37	43
4	Willingness to negotiate shipping fees	10	15	20	31	4	6	48
11	Staff qualifications	9	14	8	12	17	26	48
16	Claims	6	9	5	8	19	29	54
13	Willingness to negotiate the level of service	5	8	9	14	6	9	69
10	Preparation of the shipment	2	3	4	6	31	48	43
17	Carrier’s trading skills	1	2	1	2	33	51	46
15	Services connected with towing	0	0	1	2	34	52	46

Source: own elaboration on the basis of the survey held by S. Krawczyk.

Table 4. Trading companies – criteria for carrier selection

No	Name of the criterion	Categorical criterion		Reference criterion		Enriching criterion		% of non indicating
		number	% of indications	number	% of indications	number	% of indications	
1	Reliability and regularity of the delivery time	32	91	1	3	1	3	3
9	Loss or damage of the delivery	19	54	7	20	3	9	17
3	Total time of delivery in “the door to door” mode	18	51	7	20	2	6	23
2	Shipping fees and the costs of transportation ”from door to door”	17	49	5	14	5	14	23
12	Shipment’s monitoring	15	43	7	20	3	9	29
8	Services of direct receipt and delivery	14	40	5	14	4	11	34
7	Frequency of a service	10	29	6	17	1	3	51
4	Willingness to negotiate shipping fees	8	23	5	14	1	3	60
18	Special equipment	8	23	6	17	10	29	31
6	Availability of the equipment	7	20	12	34	6	17	29
14	Flexibility in preparing timetables	6	17	4	11	5	14	57
16	Claims	5	14	5	14	3	9	63
5	Financial stability of a carrier	4	11	7	20	4	11	57
10	Preparation of the shipment	3	9	4	11	13	37	43
11	Staff qualifications	3	9	2	6	9	26	60
13	Willingness to negotiate the level of service	2	6	8	23	3	9	63
15	Services connected with towing	0	0	2	6	17	49	46
17	Carrier’s trading skills	0	0	3	9	12	34	57

Source: own elaboration on the basis of the survey held by S. Krawczyk.

Table 5. The army's and service companies' criteria for carrier selection

No	Name of the criterion	Categorical criterion		Reference criterion		Enriching criterion		% of non indicating
		number	% of indications	number	% of indications	number	% of indications	
1	Reliability and regularity of the delivery time	28	82	3	9	3	9	0
2	Shipment fees and the costs of transportation "from door to door"	15	44	6	18	4	12	26
6	Availability of the equipment	15	44	6	18	6	18	21
3	Total time of delivery in "the door to door" mode	13	38	8	24	7	21	18
12	Shipment's monitoring	13	38	5	15	10	29	18
7	Frequency of a service	12	35	5	15	6	18	32
11	Staff qualifications	12	35	10	29	2	6	29
9	Loss or damaging of the delivery	11	32	4	12	7	21	35
5	Financial stability of a carrier	8	24	7	21	10	29	26
4	Willingness to negotiate shipment fees	7	21	12	35	6	18	26
10	Preparation of the shipment	6	18	6	18	10	29	35
16	Claims	6	18	4	12	8	24	47
18	Special equipment	6	18	5	15	9	26	41
8	Services of direct receipt and delivery	5	15	7	21	6	18	47
13	Willingness to negotiate the level of service	5	15	4	12	10	29	44
14	Flexible timetables	4	12	6	18	11	32	38
15	Services connected with towing	0	0	1	3	15	44	53
17	Carrier's trading skills	0	0	2	6	12	35	59

Source: own elaboration on the basis of the survey held by S. Krawczyk.

outlook and not be taken for granted, since the number of respondents representing each group is not big enough to draw general and objective conclusions. Results presented in tables: 3, 4, 5 are arranged in the same way as in table nr 2.

The results obtained among producing enterprises do not differ much from the ones presented in the comprehensive itemization.

There is a relatively large discrepancy between the results obtained in producing and trading companies. The representatives of trading enterprises highly value such criteria as: "Loss or damage of the delivery", which is on the very high, second place, in our study, and "Shipment's monitoring", as well as "Services of direct receipt and delivery", which in our survey carried out among producing companies came 6th and 9th accordingly. Differences in referential criteria are also significant. Managers who represent trading companies give much more attention to measures like: "Willingness to negotiate the level of service" and "Special equipment".

Differences in the results between the three categories of enterprises are most vivid on the example of service companies. Among categorical criteria the measure: "Reliability and regularity of the delivery time" was indicated the least number of times. Among 5 the most significant categorical criteria the third place of "Availability of the equipment" grabs our attention as this factor was not so very much appreciated by producing and trading companies. To the category of four most prominent reference criteria, apart from highly valued by other companies: "Willingness to negotiate shipping fees and Shipment's monitoring" we can add two new criteria: "Staff qualifications" and "Total time of delivery in "the door to door" mode".

The high place of the criterion: "Reliability and regularity of the delivery time" can focus our attention when we compare the results obtained in every group. The highest place of this decisive factor means that every enterprise aims at providing reliable and good quality service. It is very interesting that delivery of quality and punctuality is very important for executive officers of production companies (98% of indications).

Among reference criteria: "Willingness to negotiate shipment fees", "Availability of the equipment," "Loss or damage of the delivery," "Shipment's monitoring," "Staff qualifications" and "Total time of delivery in "the door to door" mode" had the biggest number of indications. Proportional differences in indicating reference criteria, in three groups, results from a specific character of a given company's industry.

In the enriching criteria "Services connected with towing" and "Carrier's trading skills" are in the lead. The differences among three groups of enterprises in the number of indicating them are not big. Surprisingly managers agree that these factors are important to the transportation process. Preferences of a carrier selection are similar when it comes to companies working on Polish market. The biggest stress is put on the quality and punctuality, however, a moderate price is also an advantage. Discrepancies in perceiving the importance of the criteria of carrier selection often results from individual needs of specific carriers and their branches of industry.

Table 6. The summary of the most important 5 categorical, 3 reference, and 2 enriching criteria for the three groups which took part in the survey

Producing company	Trading company	Service company and the army
CATEGORICAL CRITERIA		
Reliability and regularity of the delivery time	Reliability and regularity of the delivery time	Reliability and regularity of the delivery time
Total time of delivery in “door to door” mode	Loss or damage of the delivery	Shipment fees and the costs of transportation “from door to door”
Shipment fees and the costs of transportation “from door to door”	Total time of delivery in “the door to door” mode	Availability of the equipment
Availability of the equipment	Shipping fees and the costs of transportation “from door to door”	Total time of delivery in “the door to door” mode
Loss or damage of the delivery	Shipment’s monitoring	Shipment’s monitoring
REFERENCE CRITERIA		
Shipment’s monitoring	Availability of the equipment	Willingness to negotiate shipment fees
Loss or damage of the delivery	Willingness to negotiate the level of service	Staff qualifications
Willingness to negotiate shipping fees	Shipment’s monitoring	Total time of delivery in “the door to door” mode
ENRICHING CRITERIA		
Carrier’s trading skills	Services connected with towing	Services connected with towing
Services connected with towing	Carrier’s trading skills	Carrier’s trading skills

Source: own elaboration on the basis of the survey held by S. Krawczyk.

This research indicates that for the Polish companies very important is good relationship with carriers. The carrier companies should remember that competition in Polish economy is getting stronger so very important is to implement all criteria connected with quality and punctuality in a good price.

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ANALIZA WAŻNOŚCI KRYTERIÓW WYBORU PRZEWOŹNIKA

Streszczenie: Działalność ubezpieczeniowa jest związana z występowaniem ryzyka i obejmuje m.in. wycenę portfela i analizę jego szkodowości. Firma ubezpieczeniowa dokonuje wyceny ubezpieczeń przy tzw. bazowej stopie oprocentowania. Podstawą prawidłowej wyceny jest zbadanie procesu zagregowanej wypłaty, który obejmuje wszystkie świadczenia wynikające z zawartych umów. W pracy zbadano wpływ stopy procentowej na rozkład procesu wypłat. Aby ten cel osiągnąć, w pracy określono rozkład skumulowanych świadczeń w indywidualnym ubezpieczeniu i przedstawiono postać rekurencyjną dystrybuanty procesu skumulowanych świadczeń (zagregowanej wypłaty). Znajomość rozkładu zagregowanej wypłaty z portfela pozwala ubezpieczycielowi dokonać poprawnej wyceny ubezpieczenia i oceny jego ryzykowności w zależności od przyjętej stopy procentowej.