Evaluation Of Distributors In the Process Of Commercialization Of Innovative Production

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Abstract — **Distributors operating in the distribution channel and performing the same activities do not always do it in the same way. For a manufacturer relationships with some distributors will always be more beneficial than with others. It may become clear that the distributor who sells the largest volumes of goods, in fact, does not bring much profit to the producer, whereas a small trading company may have a significant potential. Therefore, it is necessary to analyze and optimize each aspect of cooperation with distributors. The analysis and optimization should be performed bearing in mind both the manufacturer and the consumer.**

The paper presents an evaluation of the system of distributors during the commercialization of innovative production. The evaluation is conducted on the example of companies from the chemical industry and is based on the improved criteria. For each assessment criterion, the appropriate scale and formula for calculating the integral estimate are determined. The proposed approach deepens the existing theoretical and practical approaches in marketing distribution policy.

Index Terms — distributor, commercialization, innovative production, industrial enterprise.

I. INTRODUCTION

Distributors functioning in the distribution channel and performing the same activities do not always do it in a similar way. Relationships with certain distributors will always be more profitable in comparison to others. In order to find out who is who, through which distributor a company makes the biggest amount of money, and which distributor brings only losses, it is necessary to analyze every aspect of relationship between the company and its various distributors. It may turn out that the distributor who provides the biggest sales figures does not actually bring much profit to the manufacturer, and a small trading firm, on the contrary, may offer a considerable profit-making potential. Therefore, it is necessary to constantly optimize work with distributors, especially during the process of commercialization of innovative products, and to evaluate them both from the standpoint of the producer and the consumer. Therefore, the purpose of this publication is to evaluate distributors in distribution channels on the basis of an improved criteria system for the commercialization of innovative products.

In order for the cooperation with the distributors to be effective, the manufacturer needs to evaluate and analyze the results and market opportunities of individual distributors. The literature mentions a number of methods of estimating distributors based on different combinations of constituent indicators (Stadnichenko 2018). Taking into account the above, it should be noted that each of the analytical method is effective and efficient because each of them evaluates a particular activity.

On the grounds of the analysis of the combined methods, it can be concluded that the comparative analysis of the economic activities of the dealer companies is the most effective because it uses different methods of analysis. Considering the above, the following criteria are proposed as criteria for evaluating distributors by the industrial enterprises: compliance of the actual sales volume with the planned volume; attracting new customers and developing relationships with existing ones; the share of the distributors in the total volume of sales of the industrial enterprise, compared to the co-working expenses; fulfillment of contractual conditions.

Let us take a closer look at each of the criteria for evaluation and selection of distributors in the conditional example.

II. COMPLIANCE OF THE ACTUAL SALES VOLUME WITH THE PLANNED VOLUME

This criterion involves the process of identifying distributors who execute, not execute, or exceed the planned sales volume. Herewith, each distributor is assigned with the following points: 2 - the plan is exceeded; 1 - the plan is executed; 0 – the plan not executed, Table 1.

Data on actual and planned sales volumes are given in Table 2.

TABLE 1.

SALES VOLUMES, PHYSICAL UNITS OF MEASUREMENT

Distributor	Distributor description	Sales volume		Absolute deviation	Growth rate,%	Score
		Plan	Fact			
1						
2						
…						

TABLE 2.

PRODUCTS SALES VOLUMES OF THE ANALYZED ENTERPRISE, PHYSICAL UNITS OF MEASUREMENT

Distributor	Distributor description	Sales volume		Absolute deviation	Growth rate,%	Score
		Plan	Fact			
Distributor 1	the exclusive distributor of titanium dioxid pigment in the European market	85,335	95,465	10,13	11,87	2
Distributor 2		5975,335	6017	41,665	0,7	2
Distributor 3	distributors of mineral fertilizers in the Ukrainian market	8510	9223,61	713,61	8,39	2
Distributor 4		10510	11271,345	761,345	7,24	2
Distributor 5		36002,165	36379,77	377,605	1,05	2
Distributor 6	distributor in Malaysia, Portugal, Italy, North and Latin America markets	33896,83	33211,385	-685,445	-2,02	0
Distributor 7	distributor in the markets of the Far East and Latin America	30192,165	30234,53	42,365	0,14	2
Distributor 8	distributor of titanium dioxide in the markets of Africa and Latin America	32192,165	32957,22	765,055	2,38	2
Distributor 9	distributor of titanium dioxide in Canada and the USA	13869,835	14252	382,165	2,76	2
Distributor 10	distributor of NPK fertilizer	20326,835	20783,8	456,965	2,25	2
Distributor 11		5975,335	5935	-40,335	-0,68	0
Distributor 12	distributor of titanium dioxide in Poland	6780	7093	313	4,62	2
Distributor 13	distributor of titanium dioxide in Asian market	5000	5400	400	8	2
Distributor 14	distributor in Turkey	4830	4922	92	1,9	2
Distributor 15	distributor in the German market	8700	8900	200	2,3	2
Distributor 16	distributor of titanium dioxide in the Ukrainian market	12347	12421	74	0,6	2

Source: Primary information of the analyzed enterprise is collected and systematized by the author

According to Table 2, almost all distributors outperform the plan except for distributors 6 and 11. In this case, distributors 8 and 4 are the most profitable by chosen criterion, since they exceed the plan with greater variance.

III. ATTRACTING NEW CUSTOMERS AND DEVELOPING RELATIONSHIPS WITH EXISTING ONES

The main criterion of customer behavior that determines the attractiveness of a distributor, ranked in order of priority are: prices, availability of the required product/a wide range, service, quality of the product, popularity in the market, location etc. Suggested rating scale:

0 - no prospect of attracting new clients and developing relationships with existing ones (does not satisfy the most significant indicators of attractiveness);

1 - low prospect of attracting new customers and developing relationships with existing ones (distributor satisfies 1 of the 4 most important indicators of attractiveness);

2 - average prospect of attracting new customers and developing relationships with existing ones (distributor satisfies 2 of the 4 most important indicators of attractiveness);

3 - high prospect of attracting new customers and developing relationships with existing ones (distributor satisfies all or at least 3 of the 4 most important indicators of attractiveness).

The analysis of distributors was performed according to the specified criterion (all conclusions are made on the basis of the results of client's pre-poll of the analyzed enterprise), see Table 3.

TABLE 3.
EVALUATION OF DISTRIBUTORS OF THE ANALYZED ENTERPRISE
ON THE CRITERION OF ATTRACTING NEW CUSTOMERS AND
DEVELOPING RELATIONSHIPS WITH EXISTING ONES

Distributor	Characteristic	Score
Distributor 1	skilled workers, the range is quite wide, the prices are high	2
Distributor 2	qualified staff, a wide range and quite low prices	3
Distributor 3		
Distributor 4		
Distributor 5		
Distributor 6	high prices, experienced staff, but range of products is not wide enough	1
Distributor 7	wide range of goods, low prices, but staff is not qualified enough	2
Distributor 8	qualified staff, low prices and a wide range	3
Distributor 9	wide range of goods, low prices, but staff is not qualified enough	2
Distributor 10	high prices, experienced staff, but range of products is not wide enough	1
Distributor 11	experienced staff, but prices are high and range of products is narrow	1
Distributor 12	qualified staff, low prices and a wide range	3
Distributor 13	wide range of goods, low prices, but staff is not qualified enough	2
Distributor 14	high prices, experienced staff, but range of products is not wide enough	1
Distributor 15	skilled workers, the range is quite wide, but prices are high	2
Distributor 16	wide range of goods, low prices, but staff is not qualified enough	2

Source: Primary information of the analyzed enterprise is collected and systematized by the author.

IV. THE SHARE OF DISTRIBUTORS IN THE TOTAL VOLUME OF SALES OF THE INDUSTRIAL ENTERPRISE, COMPARED TO THE CO-WORKING EXPENSES

Expenses include, among others, the cost of brokering, the share in shipping costs, the delivery of flyers. Table 4 can be considered as an example.

TABLE 4.
DISTRIBUTOR'S SHARE IN TOTAL SALES AND IN CO-WORKING EXPENSES.

Distributor	Sales of products by distributors		Co-working expenses		Difference between the particles	Score
	Sales volume, physical unit	Share, %	Amount of expenses, cash units	Share in%		
1						
2						
…						

Ideally, the distributor's share in the overall profit of the enterprise should be bigger than the share of the co-working expenses with that distributor. The greater this difference (Δ), the more advantageous the cooperation with distributors.

The following rating scale is proposed:

0 - the share of distributors in the total profit of the firm is smaller than the share of co-working expenses with this distributors, Δ <0;

1 - the share of distributors in the total profit of the firm is equal to the share of co-working expenses with this distributors, Δ = 0;

2 - the share of distributors in the total profit of the firm is bigger than the share of co-working expenses with this distributors, Δ> 0.

The data on the distributor's share in the overall profit of the enterprise and the share of the co-working expenses with that distributor, as well as the results of the evaluation are presented in Table 5.

V. FULFILLMENT OF CONTRACTUAL CONDITIONS

The fulfillment of the contractual terms by the distributors presupposes the observance of the time-lines, delivery terms and conditions, prices and terms of payment, transportation and storage, packaging and packing, order of acceptance and transfer of goods.

Each of the aspects of the contractual terms is proposed to be analyzed by the following point evaluation:

0 - not executed;

0,5 - partially executed;

1 - fully implemented.

The fulfillment of the contractual terms by the distributors can be analyzed, for example, by using Table 6.

The results of the analysis of the fulfillment of contractual terms by the distributors of the analyzed enterprise are given in Table 7.

The next step was the final complex (integrated) evaluation of distributors.

VI. INTEGRAL EVALUATION OF DISTRIBUTORS

For the comprehensive evaluation of distributors, firstly the weight of each criterion on the basis of the peer review method was determined. In order to define the required number of experts, the following methods were used: formal, by which the number of experts is determined by special formulas; and informal, where the number of experts is an arbitrary number, that usually varies from 10 to 20 people (Grabovetskij 2010). The expert group is formed by people who are competent to work with distributors and represent the interests of the concerned groups. In particular, the group may include executives and leading specialists of the analyzed company.

The weight of each criterion is calculated by the following formula [2].

$$W_i = \frac{\sum_{j=1}^{m} W_{ij}}{\sum_{i=1}^{n}\left(\sum_{j=1}^{m} W_{ij}\right)},$$

(1)

$$W_{ij} = \frac{C_{ij}}{\sum_{i=1}^{n} C_{ij}},$$

(2)

Where:

W_i – total weight given to the i-th indicator by experts;

m_i – a number of experts;

n – a number of evaluation parameters;

W_j – a rank provided by the j-th expert to the i-th indicator;

S_{ij} –an evaluation of the value of relative weight (in points) provided by

the j-th expert to the i-th factor.

TABLE 5.

DISTRIBUTOR'S SHARE IN THE OVERALL PROFIT OF THE ENTERPRISE AND THE SHARE OF THE CO-WORKING EXPENSES

Distributor	Sales of products by distributors		Co-working expenses		Difference between the particles	Score
	Sales volume, physical unit	Share %	Amount of expenses, cash units	Share,%		
Distributor 1	95,465	0,04	4267,9	4,26	-4,22	0
Distributor 2	6017	2,52	11269,4	11,25	-8,73	0
Distributor 3	9223,61	3,86	5190,8	5,18	-1,32	0
Distributor 4	11271,345	4,71	3789,91	3,78	0,92	2
Distributor 5	36379,77	15,22	2698,25	2,69	12,53	2
Distributor 6	33211,385	13,89	23789,5	23,76	-9,87	0
Distributor 7	30234,53	12,65	4569,67	4,56	-8,09	0
Distributor 8	32957,22	13,78	5009,3	5	8,78	2
Distributor 9	14252	5,96	5498,4	5,49	0,47	2
Distributor 10	20783,8	8,69	3249	3,24	5,45	2
Distributor 11	5935	2,48	4135	4,13	-1,65	0
Distributor 12	7093	2,97	7496	7,49	-4,52	0
Distributor 13	5400	2,26	2400	2,4	-0,14	0
Distributor 14	4922	2,06	1462,87	1,46	0,6	2
Distributor 15	8900	3,72	13543	13,52	-9,8	0
Distributor 16	12421	5,19	1769	1,77	3,42	2
Total	239097,1	100	100138,00	100	-	-

Source: Calculated by the author.

TABLE 6.

EVALUATION OF DISTRIBUTORS ACCORDING TO THE CRITERION OF THE FULFILLMENT OF THE CONTRACTUAL TERMS

Distributor	Evaluation parameter					Score
	delivery terms and conditions	prices and terms of payment	transportation and storage	packaging and packing	order of acceptance and transfer of goods	
1						
2						
…						

TABLE 7.

EVALUATION OF DISTRIBUTORS OF THE ANALYZED ENTERPRISE ACCORDING TO THE CRITERION OF FULFILLMENT OF CONTRACTUAL CONDITIONS

Distributor	Evaluation parameter					Score
	delivery terms and conditions	prices and terms of payment	transportation and storage	packaging and packing	order of acceptance and transfer of goods	
Distributor 1	1	0,5	1	0,5	1	4
Distributor 2	0,5	1	0,5	0,5	0,5	3
Distributor 3	1	1	0,5	0,5	0,5	3,5
Distributor 4	0,5	0,5	1	1	1	4
Distributor 5	0,5	1	1	0,5	0,5	3,5
Distributor 6	0,5	1	0,5	1	1	4
Distributor 7	1	1	0,5	1	0,5	4
Distributor 8	0,5	0,5	0,5	1	1	3,5
Distributor 9	1	1	1	1	0,5	4,5
Distributor 10	0,5	0,5	0,5	1	0,5	3
Distributor 11	1	1	1	1	1	5
Distributor 12	1	1	1	1	1	5
Distributor 13	0,5	0,5	1	0,5	1	3,5
Distributor 14	1	1	1	1	1	5
Distributor 15	1	1	1	1	1	5
Distributor 16	0,5	0,5	0,5	1	0,5	3

Source: Calculated by the author.

The sum of weights of all elements must be equal to one. The consistency of experts' opinions while assessing the impact of the criteria on co-working process with distributors was determined in the next step. For this purpose Kendall's

coefficient of concordance and Pearson's criterion are proposed (Grabovetskij 2010).

The coefficient of concordance varies within $0 \leq Kcon \leq 1$. The greater the value of the concordance coefficient, the higher degree of experts' opinions consistency. With complete consistency of expert opinions $Kcon = 1$, and with complete disagreement $Kcon = 0$. The low value can be explained both because of the absence of consistency of the opinions of all experts, and because of the presence of conflicting opinions between the expert subgroups, although consistency of expert opinions in the subgroup itself may be high. The calculated value ($X2p$) is compared with the value in the table ($X2t$) for n – 1 degrees of freedom and confidence probability ($P = 0.95$ or $P = 0.99$). If $X2p > X2t$, then the coefficient of concordance is significant; if $X2p < X2t$, then the number of group experts should be increased. Integral estimation is performed by the formula:

$$I_j = \sum W_i \cdot O_{ij} \rightarrow \text{мах}, \qquad (3)$$

W_i – a weight of the i-th criterion;
O_{ij} – an evaluation of the jth mediator by the ith criterion;
i – a number of criterions;
j – a number of distributors.

The results of the performed calculations can be presented as shown in Table 8.

TABLE 8.
RANKING OF DISTRIBUTORS BY INTEGRATED ESTIMATES

Distributor	Evaluation scores according to the criteria				Integral score	Rank
	Compliance of the actual sales volume with the planned volume (1)	Attracting new customers and developing relationships with existing ones (2)	The share of the distributors in the total volume of sales of the industrial enterprise, compared to the co-working expenses (3)	Fц		
1						
2						
…						

Expert evaluation for the analyzed enterprise was performed based on the following scale: 1 - low level of criterion importance; 2 - the level of importance of the criterion is below average; 3 - the average level of importance of the criterion; 4 - the level of importance of the criterion above average; 5 - a high level of importance of the criterion (Table 9).

TABLE 9.
CALCULATION OF CRITERIA WEIGHTS

Criterion	Evaluation of characteristics, points												Σ	Weight	K_{con}	X^2
	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12				
1	2	4	3	2	4	1	4	2	1	1	2	1	27	0,2	0,63	75,58
2	5	1	3	3	2	5	2	5	2	5	4	4	41	0,3		
3	4	3	2	5	4	5	4	5	3	4	5	3	47	0,35		

Source: Calculated by the author.

$I_1 = 0,2 \cdot 2 + 0,3 \cdot 2 + 0,35 \cdot 0 + 0,15 \cdot 4 = 1,6$;
$I_2 = 0,2 \cdot 2 + 0,3 \cdot 3 + 0,35 \cdot 0 + 0,15 \cdot 3 = 1,75$;
$I_3 = 0,2 \cdot 2 + 0,3 \cdot 3 + 0,35 \cdot 0 + 0,15 \cdot 3,5 = 1,825$;
$I_4 = 0,2 \cdot 2 + 0,3 \cdot 3 + 0,35 \cdot 2 + 0,15 \cdot 4 = 2,6$;
$I_5 = 0,2 \cdot 2 + 0,3 \cdot 3 + 0,35 \cdot 2 + 0,15 \cdot 3,5 = 2,525$;
$I_6 = 0,2 \cdot 0 + 0,3 \cdot 1 + 0,35 \cdot 0 + 0,15 \cdot 4 = 0,9$;
$I_7 = 0,2 \cdot 2 + 0,3 \cdot 2 + 0,35 \cdot 0 + 0,15 \cdot 4 = 1,6$;
$I_8 = 0,2 \cdot 2 + 0,3 \cdot 3 + 0,35 \cdot 2 + 0,15 \cdot 3,5 = 2,525$;
$I_9 = 0,2 \cdot 2 + 0,3 \cdot 2 + 0,35 \cdot 2 + 0,15 \cdot 4,5 = 2,375$;
$I_{10} = 0,2 \cdot 2 + 0,3 \cdot 1 + 0,35 \cdot 2 + 0,15 \cdot 3 = 1,85$;
$I_{11} = 0,2 \cdot 0 + 0,3 \cdot 1 + 0,35 \cdot 0 + 0,15 \cdot 5 = 1,05$;
$I_{12} = 0,2 \cdot 2 + 0,3 \cdot 3 + 0,35 \cdot 0 + 0,15 \cdot 5 = 2,05$;
$I_{13} = 0,2 \cdot 2 + 0,3 \cdot 2 + 0,35 \cdot 0 + 0,15 \cdot 3,5 = 1,525$;
$I_{14} = 0,2 \cdot 2 + 0,3 \cdot 1 + 0,35 \cdot 2 + 0,15 \cdot 5 = 2,15$;
$I_{15} = 0,2 \cdot 2 + 0,3 \cdot 2 + 0,35 \cdot 0 + 0,15 \cdot 5 = 1,75$;
$I_{16} = 0,2 \cdot 2 + 0,3 \cdot 2 + 0,35 \cdot 2 + 0,15 \cdot 3 = 2,15$.

The calculation of the ranking of distributors of the analyzed enterprise is given in Table 10 (bold borders highlight the best distributors, shaded parts highlight the worst distributors).

TABLE 10.
RANKING OF DISTRIBUTORS BY INTEGRATED ESTIMATES

Distributor	valuation scores according to the criteria				Integral score	Rank
Distributor 1	2	2	0	4	1,6	12-13
Distributor 2	2	3	0	3	1,75	10-11
Distributor 3	2	3	0	3,5	1,825	9
Distributor 4	2	3	2	4	2,6	1
Distributor 5	2	3	2	3,5	2,525	2-3
Distributor 6	0	1	0	4	0,75	16
Distributor 7	2	2	0	4	1,6	12-13
Distributor 8	2	3	2	3,5	2,525	2-3
Distributor 9	2	2	2	4,5	2,375	4
Distributor 10	2	1	2	3	1,85	8
Distributor 11	0	1	0	5	1,05	15
Distributor 12	2	3	0	5	2,05	14
Distributor 13	2	2	0	3,5	1,525	7
Distributor 14	2	1	2	5	2,15	5-6
Distributor 15	2	2	0	5	1,75	10-11
Distributor 16	2	2	2	3	2,15	5-6

Source: Calculated by the author.

As indicated above, distributors 4 and 5 of mineral fertilizers in the Ukrainian market and distributor 8 of titanium dioxide in the markets of Africa and Latin America are the most profitable for the analyzed enterprise as they have the highest values of the integral evaluation indicator.

VII. CONCLUSIONS

The author of the paper relying on a comparative analysis of methods for evaluating distributors, proposed the following criteria to evaluate the participants of the distribution channel: compliance of the actual sales volumes with the planned volume; attracting new customers and developing relationships with existing ones; the share of the distributors in the total volume of sales of the industrial enterprise, compared to the co-working expenses; fulfillment of contractual conditions. The proposed criteria deepen the existing theoretical and

methodological approaches to evaluation of distributors within the framework of marketing distribution policy and improve the efficiency of the process of selection of participants for the channel during the time of commercializing innovative products of industrial enterprises. Prospects for further research in this area are the practical application of the proposed approach and the development of recommendations for enterprises in the industrial complex.

VIII. ACKNOWLEDGMENTS

IX. AUTHOR CONTRIBUTIONS

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X. CONFLICT OF INTEREST

The author declares that there are no conflicts of interest regarding the publication of this manuscript. In addition, the ethical issues; including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy has been completely observed by the author.

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