

Model of Management of Competitiveness of a Machine-building Complex

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Abstract: At the present stage of the economic relations development, competitive fight both in domestic and on the world market becomes more and more tougher. Thus it should be noted that connection between competitiveness of the enterprise and condition of its economic situation. Therefore, for the enterprise that seeks to break forth to the world market, management of competitiveness becomes a decisive factor.

Key words: Mechanical engineering • Enterprise • Competitiveness • Management model

INTRODUCTION

Research of competitiveness of machine-building enterprise demands carrying out quantitative assessment and use of received results when developing strategy of the enterprise in conditions of the market competition. The developed model of management of competitiveness of the enterprise, is based on the following indicators [1]: capabilities; market requirements satisfaction degree; results of financial and economic activity.

The model can be used when studying competitiveness of the enterprise for the purpose of definition of the main disproportions between its capabilities and results of activity and also development of organizational and economic actions eliminating these disproportions.

Theoretical: In the developed model of competitiveness management of enterprise the problem of management and assessment of enterprises competitiveness is based on calculation of value of indicators of competitiveness of the compared enterprises for the purpose of their arrangement relating to enterprises of competitors. Procedure of its implementation consists of sequence of the following steps [2]:

Step 1: Definition of the main single indicators characterizing competitiveness of the enterprise. Set of the compared enterprises are presented by set of single

indicators of competitiveness, where i - number of an indicator of competitiveness ($i=1,2, \dots$, enterprise n) j -th ($j=1,2, \dots, m$);

Step 2: Definition and carrying out market researches of indicators and major factors of competitiveness of the enterprise and its competitors;

Step 3: Determination of importance of each coefficient of ponderability of single indicators for providing a reasonable assessment of competitiveness level of the enterprise;

In Table 1.1 indexes i, j - numbers of compared indicators ($i, j = 1,2, \dots, 9$ $k=1, 2, \dots, 9$). The algorithm of calculation of coefficients of ponderability of the indicators characterizing competitiveness level of the enterprise is presented in Table 1.1.

It is possible to use the method of points presented by formula (1.1):

$$k = \sum_{j=1}^d (B_{ij} / B_{qj}) / d,$$

where: k_i - coefficient of ponderability of i -th indicator of competitiveness of the enterprise; i - indicator number; j - number of expert; d - number of experts; B_{ij} - the point assigned to i - th to a j -th indicator by the expert; B_{qj} - score, assigned by j -th expert to all indicators.

Table 1.1: Calculation of ponderability coefficients of the indicators characterizing level of competitiveness of the enterprise

№ п/п	Indicator name	P1	P2	P 3	P 4	P 5	P 6	P 7	P 8	P9
1	Marketing activity (P1)	1	α_{21}	...	...	...	...	...	...	α_{91}
2	Profitability of sales (P2)	α_{12}	1	...	...	...	...	...	...	α_{92}
3	Financial situation (P3)	α_{13}	α_{23}	1	...	...	...	...	...	α_{93}
4	Image (P4)	α_{14}	α_{24}	...	1	...	...	...	...	α_{94}
5	Competitiveness of a product (P5)	α_{15}	α_{25}	...	...	1	...	...	...	α_{95}
6	Management efficiency (P6)	α_{16}	α_{26}	...	...	...	1	...	...	α_{96}
7	Innovative development of the region (P7)	α_{17}	α_{27}	...	...	...	...	1	...	α_{97}
8	Introduction of innovative technologies (P8)	α_{18}	α_{28}	...	...	...	...	...	1	α_{98}
9	Introduction of innovations (P9)	α_{19}	α_{29}	...	...	...	...	...	...	1
The sum of coefficients on each indicator of S_i		$S_1 = \sum_{i=1}^P 1i$	$S_2 = \sum_{i=1}^P 2i$	...	...	...	...	...	...	$S_9 = \sum_{i=1}^P 9i$
Calculation of coefficients of ponderability of indicators of competitiveness of P_i		$P_1 = \frac{S_1}{S}$	$P_2 = \frac{S_2}{S}$							$P_9 = \frac{S_9}{S}$
Result of summation of coefficients on all indicators		$S = \sum_{i=1}^P S_i$								

Table 1.2: Calculation of ponderability coefficients of the indicators characterizing level of competitiveness of the enterprise on example of JSC KAPO named after S. P. Gorbunov

№ п/п	Indicator name	P1	P2	P3	P4	P5	P6	P7	P8	P9
1	Marketing activity	1	9	8	3	7	2	6	5	4
2	Profitability of sales	2	1	7	4	9	3	5	6	8
3	financial situation	3	8	1	5	9	4	2	7	6
4	Image	2	4	5	1	8	3	7	9	6
5	Competitiveness of a product	7	3	4	8	1	9	2	5	6
6	Management efficiency	7	2	9	6	8	1	5	3	4
7	Innovative development of the region	2	4	3	5	8	7	1	9	6
8	Introduction of innovative technologies	2	9	7	5	6	4	8	1	3
9	Introduction of innovations	2	9	8	3	7	4	6	5	1
The sum of coefficients on each indicator of S_i		28	49	52	40	63	37	42	50	44
Calculation of ponderability coefficients of competitiveness indicators of P_i		0.07	0.12	0.13	0.10	0.16	0.09	0.10	0.12	0.11
Result of summation of coefficients on all indicators		405								

The quantity of indicators depends on tasks which are set at determination of competitiveness of the enterprise and also, on features of its activity, market position held by it in comparison with other enterprises. [3, 4].

Step 4: Research of major factors of competitiveness and definition of expected level of competitiveness of the compared enterprises;

Step 5: Carrying out analysis of single indicators of competitiveness of enterprise.

RESULTS

To compare degree of ponderability of indicators of competitiveness of the enterprise, more visually we use the chart presented in Fig. 1.

When comparing several producers of cargo planes, the condition of the enterprise is investigated according to indicators characterizing competitiveness in comparison with his competitors, more visually it can be seen in Table 1.3.

When comparing competitors on production of cargo planes depending on condition of their competitive positions, points from 1 to 5 are established, the most minimum indicator is 1 that means the worst condition of

the producer in comparison with his competitors and 5 is the highest coefficient which shows high level of competitiveness of the producer in comparison with competitors.

On the basis of the above there was developed the model of management competitiveness of the enterprise which is presented in Figure 2.

From the developed model it is visible that leading places are taken by producers of cargo planes (Airbus A400M (France) and C-130J-30 (USA)), comparing domestic producers, the leading place is taken by producer An-70 (in the long term production will be arranged on KAPO named after S. P. Gorbunov).

Table 1.3: Comparative analysis of cargo planes relating to one class, but made by different producers

№п/п	Indicator Name	An-70 (Russia)	Il-76MD-90A (Russia)	Airbus A400M (France)	C-130J-30 (USA)	Shaanxi Y-9 (China)
1	Marketing activity	3	2	4	5	1
2	Profitability of sales	2	1	5	4	3
3	Financial situation	3	1	5	4	2
4	Image	4	2	5	3	1
5	Competitiveness of a product	3	1	5	4	2
6	Management efficiency	1	2	4	5	3
7	Innovative development of the region	4	2	5	3	1
8	Introduction of innovative technologies	3	1	4	5	2
9	Introduction of innovations	3	1	5	4	2
Sum of coefficients		26	13	42	37	17

Ponderability coefficients of competitiveness indicators of the enterprise

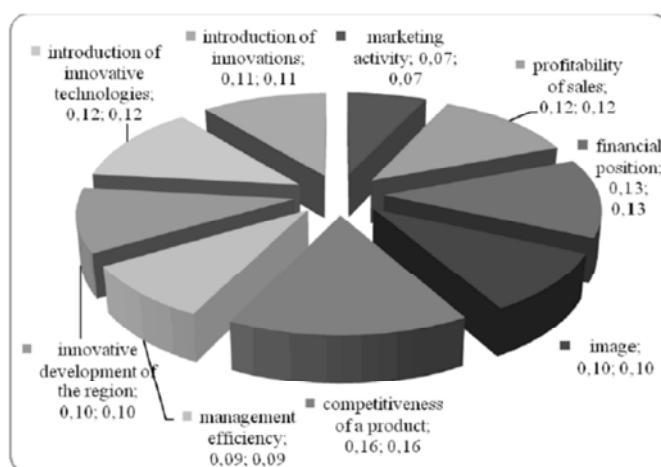


Fig. 1: Step 6. Consists in distribution of coefficients depending on indicators of research of competitiveness of the enterprise. Distribution of coefficients is carried out as follows: 0,07 - marketing activity; 0,12 - profitability of sales; 0,13 - financial position; 0,10 - image; 0,16 - competitiveness of a product; 0,09 - management efficiency; 0,10 - innovative development of the region; 0,12 - introduction of innovative technologies; 0,11 - introduction of innovations.

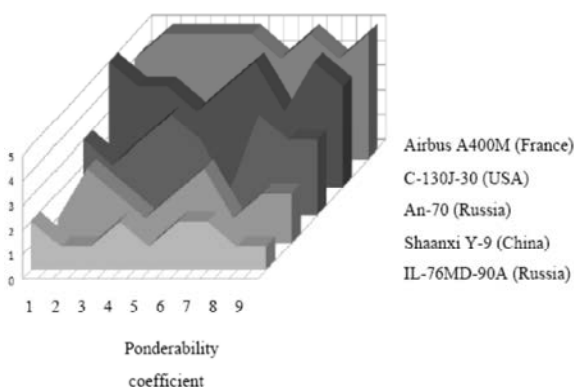


Fig. 2: Model of competitiveness management of the enterprise on the example of cargo planes of domestic and foreign production. 1. Marketing activity; 2. Profitability of sales; 3. Financial situation; 4. Image; 5. Competitiveness of a product; 6. Management efficiency; 7. Innovative development of the region; 8. Introduction of innovative technologies; 9. Introduction of innovations.

CONCLUSION

According to this model, it is possible to determine the main directions for increase of level of competitiveness of the enterprise. Study of strengths and weaknesses of competitors. Focus efforts on improving of lagging behind positions of the enterprise.

At measurement of competitiveness of the enterprise all above factors have to be considered. Increase of the above indicators of the enterprise and its competitive situation represents in aggregate a condition of competitiveness of the enterprise. Results of financial and economic activity of the enterprise show real reflection of the reached situation of competitiveness and therefore they have to be used as one of its characteristics [5].

Any enterprise, in modern market conditions using its core capabilities has to aim at, first, improvement of results of the financial and economic activity and secondly - the maximum satisfaction of requirements of the market. Therefore, it is necessary to define and operate competitiveness of the enterprise, using the developed model of competitiveness management of the enterprise. High levels of coefficients of each of indicators guarantee high competitiveness of the enterprise as a whole in comparison with its competitors.

Introduction of model of enterprise competitiveness management, will allow the enterprise, to increase productivity of administrative decisions concerning questions of optimization of production resources, introductions of innovations and innovative technologies for increase of competitiveness of the enterprise.

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