

Cognitive Modeling In The Mechanism Of Strategic Management Of Industrial Enterprise Potential Development

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The article presents theoretical and methodical bases for management of industrial enterprise potential development. As the basis for the implementation of management actions we propose to use the appropriate mechanism. The potential development is considered in the context of improving the elements of enterprise material and technical base. The article represents the usage of cognitive modeling as justification tool for the program of enterprise potential development elaboration. This tool should contribute to creating the optimal list of actions for assistance to enterprises material and technical base development.

the potential of enterprise, mechanism for managing, material and technical basis, the program of development, cognitive modeling.

Statement of the problem. Recent trends of the national economy have considerably actualized the studies focused on overcoming the crisis associated with macroeconomic disproportions as well as numerous problems of functioning of individual entities. To solve such problems as rapid aging and increasing deterioration of labor, decreasing in industrial production, limited funding for programs to modernize production, high costs of objects of labor used in the production and reduction of added value obtained from their usage is only possible by creating the appropriate resources and technical support.

It should be noted that the basis to increase efficiency of industrial enterprises is an activation of resource conservation programs and mobilization of improving product quality reserves, an increase in susceptibility to innovation and anticipating adaptation to technological change, an attraction of investments in technological renovation and structure optimization of resources used in the production. Aggregation of the mentioned areas allows talking about the necessity to develop potential of enterprises based on building the appropriate mechanism.

Analysis of recent researches and publication. Let's pay attention to quite common in economic research such a category as potential and a number of concepts to determine its nature. Scientists generally [2, 11] consider the potential due to a certain type of company resources and opportunities for their usage. Accordingly, potential development can be considered in the context of improving the elements

of enterprise material and technical base (EMTB). It has already been proved by the authors of this article [8].

Some scientists consider the potential as an important lever of guiding managerial influences from the side of company management. For example, V. S. Ponomarenko [12, p. 90-92] considers potential as one of the main characteristics of the system efficiency of the enterprise. M. V. Novikova [10], in turn, shifts the focus of attention on the management of strategic potential; its high level is the basis of sustainable enterprise development. These studies confirm the relevance of building outlines to manage company potential focused on optimizing the usage of its elements.

Thus, the vast majority of scientific researches are dedicated to identify the content of the category potential, the evaluation of the efficiency of its usage or building outlines to manage enterprise potential, based on the results of such evaluation.

However, the aspect of establishing causal relationships between the processes of potential development and actions of the enterprise management requires certain expansion. It should be noted that the actions of the enterprise management are formed by the appropriate mechanism. The category "mechanism" is the objective of our study. Let's consider it as a combination of dynamic [6, 7] and static [1, 9] approaches to disclose its nature. This combination of approaches allows considering mechanism through a set of levers and instruments, supported by specific software that optimize the sequence of economic phenomena.

Statement of the objective. The aim of this research is to study the development of theoretical and methodical principals of strategic management of development of enterprise material and technical base as part of its potential on the basis of cognitive modeling tool usage. To achieve the aim of the following research some authors' scientific papers [4, p. 81-112] on building mechanism of strategic management of enterprise potential development are used (MMEPD).

The main material. The basis of MMEPD performance is to form certain measures considered as guiding influences on the levers of management. It corresponds to the structural approach to define the nature of the category mechanism. Declared the dynamic approach adding requires defining the optimization circuits in the MMEPD performance based on the cognitive modeling system [5] to choose the optimal potential effects on the components of the enterprise. This article deals with the components of the enterprise potential limited only by its material and technical base. Accordingly, the basis to build such a cognitive model it is proposed to focus on objectively existed problems of

enterprises material and technical base development. Based on the identification of such problems elements of cognitive counts are allocated that match a particular MMEPD task.

The cognitive model is designed to adjust the parameters of the enterprise presence in the areas of competence. To develop appropriate measures in MMEPD it is necessary to determine the weight of relationships between factors of the model. There are several approaches to implement this condition. We will use the approach to form fuzzy cognitive maps [3, 13]. This approach involves the description of the links between the elements of the model via their linguistic representation. In most such a system of weights is used: "no effect" - [0.1..0.2] "strengthens weakly" - [0.3..0.4] "strengthens moderately" - [0.5..0.6] "strengthens greatly" - [0.7..0.8] and "strengthens much greatly" - [0.9..1.0].

However, we suggest extending the proposal accounting the features of strategic behavior enterprise. Thus such a strategic behavior is determined by accounting the existing potential of enterprise and the capacity to carry out the transformation in development. The author's view of the process is shown in Table 1.

Table 1 – Selection of strategic behavior of enterprises in the areas of competence and determination of its effect on behavior in the sphere of potential implementation

The level of potential usage (PU)	High	S_{PS}^G – providing strategic behavior (the desire to support the chosen mode of EMTB usage in combination with the constant improvement)	S_{CS}^G – creative strategic behavior (development of EMTB on the basis of innovation that provide benefits in the areas of competence)
	Low	S_{AS}^G – adaptive strategic behavior (aimed to find opportunities to improve elements of EMTB in the current S-curve of development)	S_{AS}^G – adaptive strategic behavior (aimed to find opportunities for transformational transition to the new S-curve of development)
Matrix S^G		Low	High
		The level of transformational capacity (TC)	

Thus, the use of the system of weights of the model given in Table 1 allows to get listed in the Table 2 adjacency matrixes, accounted to set count of cognitive model parameters of enterprise strategic behavior.

Table 2 – Submission of cognitive model parameters to determinants to choose the model of enterprise strategic behavior

Position	Characteristic	Presentation of adjacency matrix								
<i>TC</i> – low <i>PU</i> – high	The system of cognitive model weights focused on the use of MMEPD, which have chosen providing (S_{PS}^G) or creative (S_{CS}^G) enterprise strategic behavior in the sphere of potential implementation of EMTB development		x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
<i>TC</i> – high <i>PU</i> – high		x_1	0	0.5	0	0	0	0	0	0
		x_2	1	0	0.8	0.3	0.5	0	0.5	1
		x_3	0	0	0	0	0	0	0.5	-0.2
		x_4	0.3	0	-0.2	0	0	0	0	-0.8
		x_5	0	0	-0.5	0.3	0	0	1	-0.7
		x_6	1	0	0.9	0.9	0.9	0	0.5	1
		x_7	0.6	0	0	0.5	0.6	0	0	-1
		x_8	1	0	0	0	0	0	0	0
<i>TC</i> – low <i>PU</i> – low	This option of adjacency matrix is used for decision making within adaptive (S_{AS}^G) enterprise strategic behavior in the sphere of potential implementation of EMTB development		x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
<i>TC</i> – high <i>PU</i> – high		x_1	0	0.3	0	0	0	0	0	0
		x_2	1	0	0.7	0.3	0.5	0	0.7	1
		x_3	0	0	0	0	0	0	0.4	-0.4
		x_4	0.2	0	-0.4	0	0	0	0	-0.2
		x_5	0	0	-0.5	0.3	0	0	1	-0.6
		x_6	0.6	0	0.7	0.4	0.3	0	0.2	0.7
		x_7	1	0	0	0.5	0.6	0	0	-0.3
		x_8	0.5	0	0	0	0	0	0	0

Thus, the model provides a qualitative presentation of an impact on a particular element of EMTB or on dynamics of indicators of enterprise presence in

the area of competence.

Accordingly MMEPD performance in addition to development of measures for levers of management should focus on dynamic models to align EMTB parameters with enterprise performance parameters. An example of such a dynamic model, which is an extension of proposed in the unit approach to define the circle of enterprise's innovative susceptibility. Adding to this scheme tempo variables allows simulating the redistribution of funds between the processes of the enterprise functioning and development of its potential and potential of EMTB using the concept of system dynamics.

One of the benefits of simulation modeling is to develop models with a high level of aggregation [14]. This allows, on the one hand, simplify the time required to develop the model and increase the validity of the decisions, on the other hand. According to this feature let's develop a simulation model to align enterprise business processes with the program of the development of its material and technical base. For the modeling let's use iThink 9.0.2 complex.

Conclusions and prospects for further researches. Thus, this article presents theoretical and methodological grounds to improve the performance of mechanism of strategic management of enterprise material and technical base development as part of its potential on the basis of cognitive modeling tool usage. The mapping of process of grounding scenarios of strategic enterprise behavior in the implementation of existing potential and modeling dynamic of instruments targeting managerial impacts depending on the chosen behavior is performed. However, in the article potential is limited by its essential part as enterprise material and technical base. Thus, the prospect of further development of the copyright is to extend proposals on all components of the enterprise potential with a corresponding increase in a number of elements of cognitive count.

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