

IMPLEMENTING ADVANCED ORGANIZATION TECHNOLOGIES IN PROJECT MANAGEMENT OF CLUSTERS IN THE HEALTHCARE AND MEDICAL INDUSTRY BY MEANS OF THE KOHONEN NEURAL NETWORK

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In economic theory, the so-called behavioral economy, based on psychological and social theoretical postulates, received its rightful place. Systemic studies are increasingly turning to the study of spatial and temporal orderings and systemic interactions with the external environment and its own development potential.

Therefore, it can be concluded that the study of neural networks - natural biological and artificial - is quite a legitimate aspect of scientific interest. This article presents the attempt to implement methods of using neural networks as a promising and expedient phenomenon and the possibility of practical use of the principles of network organization in such innovative segments as the medical industry and the therapeutic and preventive environment.

In this research author tries to identify approaches to evaluate the effectiveness of regional cluster structures, based on the performance indicators of the cluster as a whole and each participant individually. The peculiarities of forming and functioning of clusters in conjunction with the needs and possibilities of budgetary financing of their organization and activities are considered. This approach take into account the possibility of inclusion in the cluster of small innovative companies that can be stable and efficient. The category of artificial neural network (ANN) as a model of organization of the modern cluster is implemented. The ANN based on a complex of characteristics and performance indicators of the cluster organization is proposed.

Innovation approach

Currently, the effectiveness evaluation of the integrated structures functioning, especially in the field of medicine and medical technology seems to be very actual [1]. Objectivization condition of evaluation can be the application of economic methods, including

principles of neurobiology and neural networks [2-4]. Let's consider one of the most important categories of integrated structures - innovation clusters, taking into consideration their importance in the development of the state's economy, are described in [5,6].

The problems of managing not only the functioning, but also the formation of production and economic structures, including regional ones, are extremely important [7-9]. At the same time, an objective assessment of their efficiency / effectiveness is one of the main tasks of enterprise management. It is also very important to choose both output and input indicators / parameters of their effectiveness.

As the output the authors determined: revenue, cost, balance profit, competitiveness, organizational and economic stability, competitiveness, expansion of production and supply of products. These parameters determine the tasks of forming a successful cluster by selecting its command. A possible method for performing the analysis of the correspondence of the given output parameters to the input is the method, using the artificial neural networks of Kohonen [10].

Findings

It seems that in the case under consideration it is expedient to use the simplest implementation of Kohonen's neural network: "the winner takes everything". Proceeding from the foregoing, author suggests input parameters / indicators, which most characterize the activity of the cluster in the healthcare and medical industry.

In particular, the components of the parameter X were chosen: X_i is the integral indicator of initiative (availability of own proposals, in joint with medical co-executors, projects, operational analysis and preparation of documents for cluster formation, effective project manager with comprehensive knowledge in economics, technology, biology and medicine; X_c - integral indicator of competence (availability of joint patents for diagnostic / therapeutic methods and devices for their implementation, cited publications in economic, technical and medical journals, licenses and certificates, relevant projects, technologies and equipment for carrying out both technical and medical-biological research, information about the developed analogs and the sales market); X_s is an integral indicator of state support (financial and other support for projects, the formation of a specialized organization, representatives of health authorities, technical enterprises and medical institutions).

The input and target output parameters / considered parameters are entered into the proposed model for determining the correspondence of the input indicators of the economic system to the specified output using the Kohonen network (Fig. 1).

Model for identifying the compliance of the input indicators of the economic system with the criterion of "survival" using the Kohonen ANN

Conclusion

Based on the results of the analysis of this compliance, a decision is made about the possibility of the participation of a medical industry enterprise or a health care institution in a cluster. Activities carried out in accordance with the proposed model, will avoid the risks most fully presented in [11].

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