

# **Scientific and Methodological Support of Regional Mechanisms of Scenario Management of Higher Educational Institutions**

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## **ABSTRACT**

When forming scenarios, universities should rely on methods of state, public and market regulation. In the scientific literature, there is no single point of view on the regulation of higher education institutions, which determines the relevance of the chosen work and the feasibility of forming regional mechanisms for scenario management of higher education institutions.

The basis for sustainable development of the region's economy and a system integrator of all the results and opportunities for increasing human capital are higher education institutions that develop the necessary competencies and encourage the population to make a conscious choice of educational routes in accordance with the increasing needs of industrial production and services. At the same time, higher education institutions themselves should actively develop, using all opportunities to determine the needs of the region in personnel of various specialization, qualifications and competence. To do this, higher education institutions in the region need to use a scenario approach to management. They need to solve a variety of organizational, economic, social and humanitarian tasks, forming strategic scenarios for sustainable development in a changing market environment.

**Keywords:** *pedagogy, scenario management, Economics of education, higher education, training*

## **1. INTRODUCTION**

The relevance of the problems of developing regional scenario management mechanisms for higher education institutions as an important tool for the formation and rational use of human capital in the region has led to a lot of attention from scientists and practitioners [1].

The research hypothesis suggests that the rational use of human capital in the region has a significant impact on its socio-economic development. Therefore, it is necessary to develop regional mechanisms for scenario management of higher education institutions that use a combination of computational and analytical methods and foresight technologies for the development of human capital in the region. This will allow us to objectively assess the economic, social and humanitarian effectiveness of regional mechanisms for scenario management of higher

education institutions, as well as determine their contribution to the development of the region's economy and local labor markets [2].

The main meaning of scenario management of regional universities is associated with the design and development of various "stories of long-term development", which are associated with the formation of an effective and adaptive environment of economic activity in the region, various plausible options that describe the development of future economic entities in the region's industries and services, which are well-structured and logical for understanding and awareness of the region's population of future prospects for education and representation in the local labor market by the criterion of ensuring the required increase in the level of human capital in the region. Due to the implementation of activities in the field of scenario management of regional universities, the strategy of the socio-economic region becomes a strict plan for the implementation of certain program activities, and acquires

the necessary flexibility to ensure that the economic entities of the region remain successful in achieving various options for the long-term development of local labor markets and educational services in the region.

## 2. METHODOLOGY

The object of research is higher educational institutions located in the territory of the capital regions (Moscow, Nur-Sultan, Ufa, Khanty-Mansiysk) and providing the formation and development of its human capital. The choice of these regions is not random, it is determined by the following parameters. Moscow is the capital of all Russia, Nur-Sultan is the capital of Kazakhstan, and both capitals maintain friendly relations. Ufa is the capital of the Republic that is part of the Russian Federation. Khanty-Mansiysk is the capital of an Autonomous region with a large donor potential for the Russian economy.

The subject of the research is approaches, methods and regional mechanisms of scenario management of higher education institutions as a tool for the development of spatial socio-economic systems aimed at the rational use of human capital in the capital region.

Theoretical and methodological approaches to the study of problems of rational use of human capital in the region are considered in the works of such scientists as L. V. Babich, N. N. Dabain, O. V. Zaborovskaya, A. L. Kekkonen, T. A. Nikerova, L. V. Ovsienko, I. N. Petrykina, S. A. Sherkunov and others.

The purpose of this research is to develop methodological approaches and practical recommendations for improving regional mechanisms of scenario management of higher education institutions.

Information and the empirical base of the study consisted of Federal and regional normative legal acts on issues of regional governance mechanisms of higher education institutions, particularly liberal arts colleges, the official data of Federal state statistics service of the Russian Federation and Republic of Kazakhstan, the Ministry of economic development, Ministry of education and science of the Russian Federation and Republic of Kazakhstan, the facts, the findings, published in scientific journals of Russia and other countries in the chosen field of study, the data of the global information network Internet, analytical reports of experts.

The theoretical and methodological basis of the research is the work of scientists specializing in regional Economics, strategic management, and forecasting. General scientific methods of cognition and study of economic and social phenomena, methods of regional economy, strategic management, forecasting, and statistics were used as research tools.

## 3. ANALYSIS AND DISCUSSION

The building and effective use of the organizational mechanism for scenario management of higher education institutions in the region – it is providing wide range of quantitative and qualitative changes of the existing capacities and conditions of organization of management of higher education institutions in the region with the implementation of the requirements of improved competitiveness, growth potential, to increase demand for results of scientific and educational activities of universities, improvement of the key performance indicators of the institutions of the local labor market and educational services in the region, improving the innovation and development parameters of the regional economy through timely diversification and modernization of the region's higher education system and rational organization of management decision making processes in higher education institutions [3, 4].

The use of organizational mechanism of the scenario of management of higher education institutions in the region allows to increase the efficiency of interaction of divisions of the University in terms of harmonization of the decisions at the level of functional-structural unit of the mechanism at the level of expertise of the unit mechanism, through the establishment of the structure of the University Center for strategic development of the University, whose primary responsibility is the implementation of the interactions with state and public institutions of the region, all economic entities of the region interested in innovative developments and educational services of the University [5].

We will further present the main computational, analytical and expert methods for constructing scenarios for managing higher education institutions (HEIs) at the regional level [6]. Considering the basic analytical and expert methodology of construction of scenarios of management of higher education institutions on the regional level as an important means to achieve certain system goals on the basis of which of the modern state system of higher professional education (HPE) in the region becomes better, with new features of functioning of higher education institutions in the region, the state, it is important to pay attention to the effectiveness of the use of resources in the system of higher professional education, as well as processes of rationalization of the structure of economic and organizational mechanisms of the scenario of management of higher education institutions in the region [7].

In other words, it is necessary to indicate the main indicators of scenario management of higher education institutions at the regional level. In this aspect, the development of computational, analytical and expert methods for building scenarios for managing universities at the regional level should be based on a system of principles:

- the principle of ensuring an integrated information, scientific and educational space in the region;

-the principle of strategic foresight of the region's need for qualified human resources on the basis of a required redundancy of training institutions in relation to short-term fluctuations in local labor market in the region;  
 -the principle of regionalization of higher education;  
 -the principle of the rational structure of production of specialties of universities in region [8];  
 -the principle of quality management of educational services; - the principle of ensuring the effective functioning of the system for regulatory financing of

universities; - the principle of priority to innovative management tools of higher education institutions in the region [8, 9];  
 -the principle of rational risk management of scientific and educational activities of universities in the region; - the principle of building a mechanism for monitoring and providing feedback on the development of universities in the region; - the principle of ensuring the priority of state scenario management of universities at the regional level.

**Table 1 Target orientation and main indicators of scenario management of higher education institutions at the regional level**

	<b>Calculation and analytical methods</b>	<b>Expert methods</b>
Economic mechanism	the number of directions and profiles of training; the cost of commercial training in high school on the main directions and profiles of training; the number of students enrolled in high school; the share of the University on the local market of educational services of the region; the number of teachers of the University; total volume of research work of the University; the number of registered employees of the University and the school of innovation; the value of citation index of University teachers; the carrying amount of the material-technical base of the University	the importance and value of the University to Russian and international scientific community; innovative susceptibility of the University; investment attractiveness of the University; the importance of the University to society and the economy of the region; competitiveness of educational services of the University; student satisfaction from teaching at the University; demand of specialists in the region, trained at the University; the level of commercialization of scientific and educational activities of the University; the degree of internationalization activities of the University
Organizational mechanism	performance of administrative work in the University; the effectiveness of the implementation of administrative functions the administration of the University; turnover; the cost of the administration of the University; the proportion of administrative personnel in the total number of employees of the University; the degree of duplication of functions of employees of the University;	the handling of the University; completeness and timeliness of achieving the goals of the University; the efficiency of decision-making in the University; the effectiveness of planning activities of the University; the satisfaction of the faculty results of the University; flexibility of the administration of the University;

	the complexity of the organizational structure of the University; the level of centralization of functions of employees in the University; the effectiveness of the use of information resources at the University	reliability of the administration of the University; the optimality of the corporate culture of the University; rationality institutional relations at the University
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Will give further characterization and description of economic methods of scenario management of higher education institutions in the region, as the main economic methodologies will be considered: a method for predicting activities of the University in the region (analytical method) and methodology of foresight technologies (expert method).

Methods of forecasting University activity as a computational and analytical method for building scenarios of University management at the regional level. The importance and role that the level of quality of initial analytical data plays today in relation to ensuring the accuracy of long-term forecasts of the University's activities in the region dictates the logic of structuring the main components of the methodology for predicting the University's activities as a computational and analytical method for constructing scenarios for managing the University at the regional level.

Based on a comprehensive study of investment and innovation processes in the region, in the HPE system and in specific universities, as well as on the results of statistical analysis of the main items of expenditure and income of participants in local labor markets and educational services in the region, the authors of forecasts of University activity in the region determine the optimal structure of the forecast model, set all the necessary initial data in the aspect of establishing dependencies between the key factors of organization and management of scientific and educational activities of the University in the region.

After debugging the forecast model, it is adjusted based on the received expert assessments, and also used to build forecasts for a fixed number of periods in relation to the established limits of the planning horizon of the University's activities in the region [17]. Further, the results of the strategic development of the University in the region are periodically monitored in order to take into account all changes in the internal and external environment of the University's scientific and educational activities.

Once again, it should be noted that the main role in ensuring the accuracy of forecasts of the University's activities in the region, which are obtained within the framework of the presented methodology, is the quality of the information used in the forecasts. Hence, preparation of all necessary baseline data in relation to the forecasting activities of the University in the region is an important

task that involves the presence of the University and special analytical methods and tools, and a wide range of management procedures for the compilation prognosis [6-8]. Thus, the preparation of all the necessary initial data in relation to the preparation of a forecast model for the University's activities in the region is impossible without the rational application of methods and principles of statistical analysis, which is designed to establish trends and patterns of changes in the main items of expenditure and income of the University [10, 11].

It is also important to understand that the statistical analysis within the modelling forecasts of the University activity in the region can be viewed exclusively as a set of formal procedures for handling data series characterizing scientific and educational activities of the University and the parameters of the functioning of the local labor market and educational services in the region. According to E. F. Siegel, statistics is, first of all, the science and art of collecting and analyzing data [12]. At the same time, the applied statistical methods should be considered an important part of the management decision-making process at the University, which allows you to develop and justify a strategy for conducting scientific and educational activities of the University, which combines the intuition of the University management with a thorough analysis of all available information in the region. Hence, the use of statistics is a significant advantage of the University in conducting competition in the region [10, 13]. As a result, statistical analysis of data is an important tool for providing a deep understanding of the transformation processes of the region's economy, the HPE system and a specific University, and this should be considered a prerequisite for building an accurate and adaptive model for predicting the results of scientific and innovative activities in the region [14, 15].

In the present methods of foresight of technology for higher education institution in the region should be identified and structured a broad roadmap – a set of integrated logistics routes, which will be the achievement of the ultimate goals of development of scientific and educational activities of the University [13]. Road maps for the development of higher education institutions in the region can be of the following functional types:

–product road map for the development of educational services of the University in the region – formation scheduled high-level quality of scientific and educational activities of universities in the region [123]; technology road

map for the development of the University, represents a qualitatively new technology for the development and implementation of scientific and educational processes at the University in the region; - problem-oriented road map of University development – a qualitatively complex version of the road map of University development, in which the formation of a completely new worldview and worldview of the HPE system and universities in the region is being prepared, a revolutionary leap is being prepared, for example, in the field of improving the rationality of interactions between the University and other participants in the regional economy. The last type of roadmaps for the development of higher education institutions in the region involves a qualitative leap in improving the efficiency of activities, in which the technical and technological component should be considered as the most important stage in ensuring the competitiveness of the regional economy [5].

The main task of the implementation methodology of the foresight of technologies applied to improving the efficiency of scientific and educational activities of the University in the region – growth of rational, as well as the formation of partnerships between the University and the state, University and private sector representatives, between the University and non-governmental organizations. At the same time, it should be noted that the method of foresight technologies is not only a technical and technological vision of the future of the HPE system and the processes of scientific and educational activities of the University in the region. The implementation of the foresight technology methodology is also associated with the formation of a cultural environment in the sphere of strategic development of the University and its partners, in other words, with the formation of a strategic culture at the level of the regional economy as a whole. It is the implementation of methodologies of foresight technologies in enhancing the efficiency of scientific and educational activities of the University in the region will provide a unified vision for regional development in relation to the largest economic entities in the region and state bodies, which define technology, innovation, socio-economic and policy environment in the region [2, 3].

The method of organizational design of higher education institutions in the region as a computational and analytical method for building scenarios of University management at the regional level. The methodology of organizational design University in the region is related to the development of formalized graphical, mathematical, mechanical and other processes mapping the distribution of authority, responsibility within the University that are primary for the construction, evaluation and analysis of the different options of organizational structures in terms of the sustainable relationship of fixed and variable characteristics of these organizational structures [1, 15]. The methodology of organizational design of higher education institutions in the region allows us to formulate a set of criteria clearly and unambiguously for evaluating

the level of rationality and adaptability of organizational decisions made in the higher education institution [12, 16]. A distinctive feature of the method of organizational design of higher education institutions in the region is the construction of analog models of the scheme of the organizational structure of the University to provide a visual representation of the goals, tasks of passing management teams and fixing formal dependencies between officials and management entities.

Project of the organizational structure of University management

**1 block.** Analysis of the current organizational structure of the University, assessment of the rationality of evaluation criteria management Principles the Relationship between decentralization and centralization Evaluation of the management system (number of employees, the presence of duplication, the nature of the distribution of responsibilities and powers) Analysis of management functions (technology and methods of decision-making, methods and principles of motivating University employees) Evaluation of the University's activities (deepening cooperation, changing technologies of activity, introduction of innovations in the University) Fixing shortcomings, determining the reasons for the slow growth in the efficiency of University management.

**2 block.** Designing the University's organizational structure

Tasks the Choice of rational type of organizational structure of University management, Clarification of quantities and units in accordance with the levels of the institution identify the number of employees of the management the determination of the nature and relations of subordination between different levels of the University Calculation of level of cost for the effective functioning of the management at the University Commit the managerial powers of the structural units, information flow, workflow, responsibility and authority 3 block. Assessment of the level of effectiveness of organizational structure of the University, within the parameters of the implementation of the decisions, organization and reliability of the system of University management, optimality and speed of decisions stems from the strategy of scientific and educational activities of the University in the region; -the composition of the production structure of the University with the identified needs of the local labor market and educational services of the University; - organizational structure of the University; - human capital of the University; -the need of the University for various resources for the period of activity; - financial and investment support of projects and programs of the University; information support of the processes of University management; policy organization of interaction between structures of the University; - efficiency of organizational design of higher education institutions in the region. The meaning of the allocation and grouping of specialized centers in the University within the framework of organizational design is related to the fact that it provides opportunities for effective use of modern

methods of system transformation of the organizational structure of the University according to the criteria of its greater rationality and efficiency [7, 9, 15, 17]. This regrouping, which is carried out with the help of financial accounting centers, allows, among other things, to expand a number of departments of the University by eliminating smaller ones.

#### 4. CONCLUSION

Scenario management functions within the framework of the methodology for determining effective managerial impacts on the University's activities are a necessary and important element of this methodology, which allows you to determine the direction and the amount of resources for the University at the level of a specific region, which is required to achieve all the goals and objectives of the University in conjunction with the strategy of functioning of the local labor market and educational services in the region [18]. Performing the functions of scenario management, as well as providing the University with all the necessary resources, is an important result of applying the methodology for determining effective management impacts.

It is also important to understand that the most important factors that influence; on the level of effectiveness of the methods to determine effective management actions should be considered as an effective mechanism for monitoring the functioning of higher education institutions in the region to establish the optimality of the status of scientific and educational activities, as well as the implementation processes in the field of financial and investment support for strategic University management finally realizing the potential of all internal sources for organizational development of the University.

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