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Theoretical-Methodological Aspects of Evaluating the Character of Integration Processes in Higher Education Organizations

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A B S T R A C T

In the scientific literature, there are rare definitions of the concept of the level of integration of universities. In addition to that, it is increasingly difficult to evaluate the integration potential (resources, infrastructure, etc.) and characteristics, as well as to evaluate the results of cooperative efforts of higher education organizations. In our opinion, considering the realities of the national and regional economy, the problem of theoretical-methodological substantiation, development and implementation and evaluation of the integration level that can be adapted to the prospects of higher education development remains relevant. The analysis of the studied sources shows that the existing methods of evaluating the level of development of the integration of higher education organizations are characterized by significant inconsistencies both in the areas of evaluation and in the criteria, indicators and tools used. The article examines the views of the author and other scientists on the integration of science, education and production. As a result of the study, the factors affecting integration, their level, and methods for calculation were developed.

1. Introduction

Formation of a single educational space in frame of Bologna process has a positive effect on the development of all universities with the globalization of the educational services market, the activation of international scientific integration, and the expansion of the innovative services market. Ratings for studying the level of integration of universities into the international, national and local innovation system have been used for a long time, but prestigious world ratings have been introduced since recent years. The following are the most common among international ratings:

1) Academic Ranking of World Universities or Shanghai Ranking – ARWU, developed by Shanghai Zhao Tong University (China);

2) QS World University Rankings, developed by Quacquarelli Symonds agency (Great Britain);

3) Times Higher Education World University Rankings (THE), developed by The Times Higher Education publishing house together with Thomson Reuters company (Great Britain).

The above-mentioned three rating criteria clearly show which indicators and functional areas should be given more attention when planning long-term future strategies of universities. Therefore, the certain subjectivity of the assessment results in their main aspects is appeared, for example, QS depends more on the level of citations and employers' opinions, the Times method depends on expert evaluations, and the ARWU method depends on the ratio of rewards and incentives and citation rates in the world's most popular "Nature and Science" scientific journal.

Self-evaluation methods of determining the integration level of higher education organizations into the

innovative system are also widespread in world practice. The most famous ones are European Foundation for Quality Management (EFQM) methodology, Malcolm Baldrige Award, Herbert Kells self-evaluation methodology, ISO-9001 evaluation methodology, European Higher Education Quality Assurance Standards and Directives - ENQA, etc.

2. Materials and Method

The methodology of the European Foundation for Quality Management (EFQM) is based on two groups of evaluation criteria known as "Capabilities" and "Outcomes". The "Capabilities" group includes the following criteria:

1. The leading role of leadership, which consists of five sub-criteria:

➢ mission, vision, values, moral principles;

➢ development and application of management system;

➢ interaction with consumers, partners and society;

➢ effort to develop a model of internal interactions, motivation and improvement;

➢ identifying and implementing organizational changes.

2. Policy and strategy, which consists of four sub-criteria:

➢ current or future needs of interested parties;

➢ implementation, measurement, research and learning;

➢ development, analysis and revision;

➢ communication and deployment in key processes.

3. Personnel management, which consists of five sub-criteria:

➢ planning, management and improvement of labor resources;

➢ knowledge and skills;

➢ confidence and enthusiasm;

➢ bilateral interaction;

➢ reward, recognition and care.

4. Resources and partners, which consists of five sub-criteria:

➢ external partners;

➢ financial resources;

➢ buildings, equipment and materials;

➢ technologies;

➢ information and knowledge.

5. Processes, products and services, consisting of five sub-criteria:

➢ development and management;

➢ process improvement;

➢ design and development management;

➢ production, delivery and service;

➢ consumers.

6. Customer satisfaction consists of two sub-criteria:

➢ work results;

➢ measuring consumer perception.

7. The level of employee satisfaction consists of two sub-criteria:

➢ work results;

➢ measure employee perception.

8. The impact of the university on society consists of two sub-criteria:

➢ work results;

➢ measuring public perception.

9. Results of activities of higher education organizations consist of two sub-criteria:

➢ key indicators of activity;

➢ key indicators of performance.

Each criterion is assigned a certain number of points and the total score for all criteria is equal to 500 points [10].

The criteria for the Baldrige Award are:

➢ organization profile;

➢ management;

➢ strategic planning;

➢ consumer orientation;

➢ measurement, analysis and knowledge management;

➢ orientation of employees;

➢ orientation to the process;

➢ results[11].

ISO-9001 is based on the general fundamental principles of quality: customer orientation, management leadership, and participation of all employees in management, process approach to organization and management, continuous improvement, fact-based decision-making, mutually beneficial relations with partners [12].

At present, there is no universal indicator system for evaluating the level of integration of higher education organizations. As mentioned, one of the most important problems of modern ratings is that it is very laborious to search for information sources and collect information using special methods, and it can lead to relatively subjective measurements. International and national rankings and their evaluation criteria, despite all their importance, do not allow for a sufficiently complete and objective evaluation of the integration efficiency of universities. In addition, many outcomes, such as infrastructure development and staff development for innovative activities, may have delayed or indirect economic effects that are not reflected in the evaluations.

The joint model of the analysis of university integration in frame of the "Institutional management in higher education" program of the Organization for Economic Cooperation and Development (OECD) partially solves the problem of showing the delayed (expected) impact on the social-economic development of the regions in the future. According to the results of the OECD research, the following are noted as the most important factors determining the success of the integration of universities into regional development:

➢ the impact of universities on employment in the region, the scope of employment of graduates;

➢ organization of small and medium companies established by the university or arising due to the presence of the university in the region;

➢ the number of patents registered by universities in the region.

The problem of the lack of a system of indicators capable of measuring and evaluating the integration policy of higher education organizations and its impact on the improvement of the well-being of the country has been bothering experts for a long time. According to authors such as I.I. Dyakov, N.A. Tretyak, K.S. Grishenko, the methodologies used to assess the level of integration at the level of individual universities or groups of universities (e.g., in the region) are very difficult and ineffective. At the same time, methodological problems remain, such as the development of formats of interaction with the evaluated university and the selection of methods of verification of data obtained from them, as well as the need to simplify the process of data selection and processing for research, ensuring its relevance and reliability [3].

Russian scientists P.V. Efremova, I.M. Romanova recommended to use the following system of indicators for the development of university activities [8]:

a) "Input" indicators, conditions ensuring the potential of the university (personnel; financial resources; infrastructure; administrative resource, including innovative culture);

b) "Process" indicators that partially reflect the indicators of innovative activity (involvement of scientific and pedagogical staff in innovative projects and their part-time work in a non-academic environment; the number of inter-university and university-enterprise joint laboratories; the number of established small and medium enterprises, start-ups , spin-offs, etc.);

c) "Product" indicators reflecting the effectiveness of innovative activity in the form of a number of effects (economic, social, environmental and other effects).

According to Kazakhstan authors, the following are the main indicators that objectively evaluate and reflect higher education organizations:

➢ quality of research and development, progress of scientific schools – K1.

➢ quality of professors, teachers and scientific staff, their competence – K2.

➢ quality of innovations, commercialization of their results, creation of SMEs, start-ups – K3.

➢ quality of material base, scientific laboratories and innovative infrastructure – K4.

➢ quality of material and moral stimulation of teachers, scientists and students – K5.

➢ quality of teaching methodology and research technologies – K6.

➢ quality of academic mobility and cooperation between universities and scientific organizations of CIS countries and abroad – K7.

➢ quality of copyright and intellectual property protection – K8.

➢ increasing the quality of the university's management system and the university's reputation – K9 [9].

Among Uzbek scientists, A. Magrupov emphasizes that the quality assurance and renewal of the educational process should be focused on issues such as management activities of universities, forecasting the creation of new systems of education and upbringing, new technologies, etc., improving the quality of the educational process and the personality of the graduate of the educational institution, analyzing the behavior of students and the potential of the market of educational services, the number and nature of pedagogical innovations, factor analysis of innovation efficiency, quick solutions for development, mastering innovations for achieving progress; performance discipline and performance quality control [1].

N.V. Panevina notes the following factors as the components of the potential of HEIs:

➢ technical – material and technical recourses of educational, scientific, auxiliary and service departments of the university;

➢ technological – educational practices, including creative technologies, computer educational programs, Internet technologies, web technologies, etc.;

➢ human (social) – the system of relations between students and university staff that ensures high-

quality education;

➢ administrative (organizational) – considered organizational structure and precise management of the university in general and management of the quality of education;

➢ economic – financing, planning, price formation, etc. [4].

M.G. Kokorev mentions in his works that organizational, psychological, pedagogical, advisory, sports and other types of actions are the main activities of higher education organizations [5]. E.B. Mikhaylova suggests that the innovative infrastructure of the higher education institution should work based on a rational combination and interaction of its components, among which the following should be distinguished: informational, technological, educational and financial-economic [2]. P.V. Efremova and I.M. Romanova recommend including the following in the group of indicators describing the innovative potential of the university:

➢ resource potential (personnel potential, material and technical potential, financial potential, organizational, informational potential);

➢ innovative infrastructure (number of units) [8].

Authors such as O.S. Gaponova, S.V. Smeltsova and Yu.Yu. Chilipenok cite three classic approaches to evaluating the integration of higher education organizations in solving the problems of social-economic development of regions: *the first*, purely economic model of D. Elliot, S. Levin and J. Meisel, which does not consider social factors, since many of the proposed indicators of this model cannot be calculated objectively, for example, the amount of money spent on living in the city by visiting students and university employees; *the second*, qualification-oriented model of B. Bluestone, G. Battu, J. Finch and D. Newland, which contains elements of qualification level assessment by estimating the increase (or decrease) in future earnings of employees after obtaining a higher education diploma, and the model is clearly the lack of which is explained by the impossibility of a precise quantitative assessment of the indicators, the difficulty of collecting sufficient data for such an assessment, and the failure to take into account the social component; *the third*, model of R. Huggins and A. Johnston, approach of P. Benneworth, D. Charles and model of G.Itskovits, which are focused on the commercialization of innovations and only the number of patents received by the university, the number of patents registered in the region, the number of publications of the university staff in RISC, Scopus, etc., their citation indexes, the university's various fields since such indicators as positions are taken into account, these approaches are too deeply specialized and cannot provide a complete and objective evaluation of the situation [6].

Based on the analyzes conducted by the authors of the Higher School of Economics of the National Research University of the Russian Federation, it is proposed to use six indicators to evaluate the effectiveness of the integration of university into the regional economy:

1) the amount of funds created by universities through tax credits to the regional budget;

2) the amount of financial resources of the university according to the total number of students as an indicator of the financial well-being of the higher education systems of the region;

3) the share of students studying on a commercial basis as an indicator of the demand for higher education;

4) the share of "target" students as an indicator of the personnel training order of regional enterprises;

5) tuition fees and accommodation expenses of students from other regions;

6) the ratio of teachers' salaries to the average salary in the region as an indicator of influence on the average salary level in the region in the direction of increase or decrease [6].

Among the Russian scientists, A.V. Kuznetsov systematized indicators of the group known as science, education and innovation and proposed to determine numerical quantities in evaluating the level of integration of the innovative environment of the higher education institution into the scientific and innovative system [7]. The method proposed by K.E. Volosevich is similar to the method of A.V. Kuznetsov. Only K.E. Volosevych follows the path of relative analysis and evaluation of the potential of a higher education institution as an integrated independent structure. The groups of systematized

indicators for the analysis are somewhat similar to the groups of indicators of A.V. Kuznetsov: education, science, business [7] . O.Yu. Vorozhbit, V.G. Krivoshapov, based on the methods of the two mentioned authors, proposed to add a group of social community indicators, paying attention to the social position of universities in their surrounding environment. The authors believe that the group of social-public indicators, added to the groups of indicators such as science, education, innovation and business, together helps to use a more complex and fully grouped method.

Despite the existence of a large number of ratings and indicators, until now, in modern practice, a single methodology has not been developed for the quantitative and qualitative diagnosis of the effectiveness of higher education organizations and the evaluation of the degree of its integration into the external environment. Any assessment devoted to the study of the effectiveness of the integration of higher education organizations into the external environment includes the analysis of a number of indicators. Researchers present various lists of indicators used to evaluate the integration of higher education organizations into the economy. However, not all recommended assessment methods in some sense can provide the opportunity to research the nature of integration of higher education organizations with the external environment in a deep, understandable, complex, detailed and useful for decision-making level.

Following conclusion formed consequently researching various scientific sources and comparing the opinions of different authors was based on the author's methodology in the analysis of the level of integration of individuals: the level of integration of higher education organizations is a set of functional services that provide the necessary conditions for the organization and effective development of mutually beneficial cooperation with the external environment, a system of activities and processes aimed at creating conditions for the well-being of the higher education institution. Our goal is to achieve that the method we propose to evaluate the nature of integrative processes in higher education organizations is comprehensible, easily adapts to specific research goals, and does not require large labor and material costs.

One of the methods of studying the integration of higher education organizations with their external environment and the dependence of internal environment factors on integration processes is the method called the method of evaluating the nature of integration processes in higher education organizations, which was offered by us. The proposed indicator system, evaluation method and decision-making algorithm are intended to help higher education organizations to prove their independence and to determine ways to develop competitive advantages by determining indicators, to ensure stronger integration of universities into the economy. The results of the assessment are primarily intended for the management and employees of higher education organizations who make management decisions aimed at the development of integration. This allows identifying the "weak points" and reserves of the development of the integration policy of higher education organizations, which in turn helps to increase their competitiveness and position in national and world rankings.

In order to eliminate the shortcomings of the methods given by international organizations and proposed by the authors in evaluating the integration level of higher education organizations, we suggest using three indicators system to determine the integration level of higher education organizations. System 1, known as the integration potential of higher education organizations (IS_j), consists of a set of 6 functional block components, the components of each functional block are calculated by special processing of digital data and consist of the arithmetic average of the sum of the "conditional functional potential" (x_i^j) indicators, which vary from 1 to 10 points depending on the position of the indicators of the group of higher education organizations and can be shown as the following formula (formula 1):

$$IS_j = IS_j^{educational} + IS_j^{scientific} + IS_j^{innovative} + IS_j^{commercialization} + IS_j^{spiritual-sport} + IS_j^{international} \quad (1)$$

This system includes constituent components consisting of 6 functional blocks and they are as follows:

a) educational potential: $IS_j^{educational} = \frac{\sum_{i=1}^{n} x_i^j}{H}$ (2)

b) scientific-research potential: $IS_j^{scientific} = \frac{\sum_{i=1}^{n} x_i^j}{H}$ (3)

c) innovative potential: $IS_j^{innovative} = \frac{\sum_{i=1}^n x_i^j}{H}$ (4)

d) commercialization potential: $IS_j^{commercialization} = \frac{\sum_{i=1}^n x_i^j}{H}$ (5)

e) spiritual-educational and physical educational potential: $IS_j^{spiritual-sport} = \frac{\sum_{i=1}^n x_i^j}{H}$ (6)

f) international cooperation potential: $IS_j^{international} = \frac{\sum_{i=1}^n x_i^j}{H}$ (7)

In order to find the conditional functional potential (x_i^j) within the functional block, the position of the higher education institution within the studied higher education organizations is determined according to each indicator. For example, if the indicator within each functional block is ranked 136-150 out of 150 higher education organizations, the higher education institution's point for this indicator is equal to "1", if it is in the range of 1-15 places, point for this indicator is equal to "10" etc.

$x_i^j = 10 - [\frac{r}{[\frac{J}{10}]+1}]$ r is the position of higher education institution,

J is the number of higher education organizations   (8)

Table 1. Criteria for evaluating the functional components of the integration potential of higher education organizations[1]

No.	Functional component of the integrative environment of the higher educational institution	Evaluation indicators
1	educational potential	y_1 is the number of people who defended scientific degree in higher education organizations in the top 1000, y_2 is the share of scientific titles, y_3 is the number of national and foreign certificates of mastering a foreign language (at least B2), y_4 is the number of resources in electronic form, y_5 is number of employees of production and research institutes involved in the educational process, y_6 is total area of all classrooms (sq.m), y_7 is number of educational classrooms, y_8 is total area of educational classrooms (sq.m), y_9 is number of computer and language classes, y_{10} is total area of computer and language classes (sq.m), y_{11} is the number of educational laboratory rooms, y_{12} is the total area of educational laboratory rooms (sq.m), y_{13} is the number of equipment of educational laboratories, y_{14} is the number of master students participating in the educational process.
2	scientific potential	y_{15} is the number of employees of production enterprises and scientific inspection institutes involved in the process of training of researchers, y_{16} is the number of employees of production enterprises and scientific inspection institutes involved in the scientific-research process, y_{17} is the number of independent researchers, y_{18} is the number of basic doctoral students, y_{19} is the number of doctoral students, y_{20} is the share of staff with scientific degrees, y_{21} is number of available patents for intellectual property, y_{22} is number of scientific laboratory rooms, y_{22} is total area of scientific laboratory rooms (sq.m), y_{24} is the number of published scientific journals, y_{25} is the number of members of specialized scientific councils , y_{26} is the number of specialized scientific councils organized for dissertation defenses.
3	innovation potential	y_{27} is the number of business incubators, y_{28} is the number of technoparks, y_{29} is the number of centers for the collective use of scientific research equipment, y_{30} is the number of available certificates for programs and electronic databases related to information and communication technologies, y_{31} is the number of various materials protected by copyright.
4	commercialization potential	y_{32} is the number of members of the alumni club, y_{33} is the amount of sponsorship through the alumni club, y_{34} is the number of sales branches located on the territory of the higher education institution, y_{35} is the number of department branches and scientific research laboratories of scientific inspection institutes organized by fields, y_{36} is the number of production

[1] Source Developed and compiled by the authors

		enterprises, y_{37} is the number of service (except trade) enterprises.
5	spiritual-educational and physical educational potential	y_{38} is the number of outdoor sports facilities, y_{39} is land area of outdoor sports facilities (sq. m), y_{40} is the number of indoor sports facilities, y_{41} is land area of indoor sports facilities (sq.m), y_{40} is the number of masters of sports, y_{40} is the number of candidates to master of sports.
6	international cooperation potential	y_{44} is the number of foreign professors-teachers involved in the teaching process, y_{45} is the number of foreign professors-teachers involved in the training of researchers, y_{46} is the number of foreign professors-teachers involved in scientific research, y_{47} is the number of grant holders of "El-yurt umidi" fund , y_{48} is the number of people who have a grant from "El-yurt umidi" fund

System 2, known as the integration effectiveness of higher education organizations (IN_j), includes six functional block components. The components of each functional block are calculated one by one in 2 steps: In step 1, the "conditional functional result" (x_i^j) indicator, which varies from 1 to 10 points depending on the position in the group of higher education organizations according to the indicators of the relevant block, is calculated by the arithmetic average of the sum of the indicators; In step 2, the "conditional functional result" indicator is multiplied by the functional correction coefficients (FCC) resulting from the survey results of all the heads of HEIs and functional service heads selected for the study.

3. Results

The system 2 of indicators, known as the results of integration of HEIs (IN_j), is calculated as follows:

$$IN_j = IN_j^{educational} + IN_j^{scientific} + IN_j^{innovation} + IN_j^{commercialization} + IN_j^{spiritual-sports} + IN_j^{international} \quad (9)$$

This system includes constituent components consisting of six functional blocks and they are as follows:

a) results of educational activities: $IN_j^{educational} = FCC^{educational} * \frac{\sum_{i=1}^{n} x_i^j}{\text{н}}$ (10)

b) results of scientific research activity: $IN_j^{scientific} = FCC^{scientific} * \frac{\sum_{i=1}^{n} x_i^j}{\text{н}}$ (11)

c) results of innovation activities: $IN_j^{innovation} = FCC^{innovation} * \frac{\sum_{i=1}^{n} x_i^j}{\text{н}}$ (12)

d) results of commercialization activity: $IN_j^{commercialization} = FCC^{commercialization} * \frac{\sum_{i=1}^{n} x_i^j}{\text{н}}$ (13)

e) results of spiritual-educational and physical training activities: $IN_j^{spiritual-sports} = FCC^{spiritual-sports} * \frac{\sum_{i=1}^{n} x_i^j}{\text{н}}$ (14)

f) results of international cooperation activities: $IN_j^{international} = FCC^{international} * \frac{\sum_{i=1}^{n} x_i^j}{\text{н}}$ (15)

Thereby, FCC is the functional correction coefficient and is determined by conducting appropriate surveys. The functional tasks of the entire higher education institution are given in no order and are asked to be ranked according to their importance for the higher education institution. The weight of each functional constituent is calculated.

The results of the questionnaire of the rector, all vice-rectors, heads of departments and representatives of infrastructural services are evaluated as follows;

$$FCC_k^j = \frac{m \cdot IN_j^x}{KN_j^{educational} + KN_j^{scientific} + KN_j^{innovation} + KN_j^{commercialization} + KN_j^{spiritual-sports} + KN_j^{international}} \quad (18)$$

х is a functional block in arbitrary order (index).

м is the number of functional blocks (currently equal to 6)

IN_j^x is an optional function block value

System 3 is a system of indicators of "integration efficiency" (IE_i^j) of higher education organizations: to calculate system indicators, system 2 indicators can be calculated by placing system 2 indicators in the picture of the ratio, and system 1 indicators in the denominator of the ratio.

$$IE_i^j = \frac{z_i^j}{y_i^j} \ (21)$$

Table 2. Evaluation criteria of functional components of results of integration of higher education organizations[2]

No	Functional component of the integration environment of the higher education institution	Evaluation indicators	Weight coefficients* of the functional component
1	Results of educational activities	z_1 is the number of defenses in the current period in higher education organizations in the top 1000, z_2 is receiving a scientific title, z_3 is the number of state scholars and winners of state award of the President of the Republic of Uzbekistan and other awards, z_4 is the number of scholars of foreign governments, embassies and foundations, z_5 is the number of international science Olympiad prize-winners, z_6 is the number of republic science Olympiad prize-winners, z_7 is the number of published textbooks, z_8 is the number of published tutorials	
2	Results of scientific activity	z_9 is the number of published scientific articles, z_{10} is the number of scientific articles published in journals included in Web of Science and Scopus databases, z_{11} is number of citations to scientific articles indexed in Web of Science and Scopus databases, z_{12} is the number of grants received under fundamental projects, z_{10} is the amount of grants received under fundamental projects, z_{14} is the number of grants received for practical projects, z_{15} is the amount of grants received for practical projects, z_{16} is the number of people who defended their PhD dissertations, z_{17} is the number of people who defended their DSc dissertations, z_{18} is the number of patents for intellectual property, z_{19} is the number of students and masters participating in the fundamental and practical projects, z_{20} is the number of published monographs, z_{21} is the number of held scientific practical conferences	
3	Results of innovative activity	z_{22} is the number of received innovative projects, z_{23} is the amount of received innovative projects, z_{24} is the number of students and masters participating in innovative projects.	
4	Results of commercial activity	z_{25} is the number of sponsorship amounts, z_{26} is income from trade centers located in the territory of HEI, z_{27} is personnel sales based on individual contracts, z_{28} is income from training courses, z_{29} is income from business contracts, z_{30} is the amount of license agreements, z_{31} is income from renting buildings and facilities, z_{32} is income from participating in the authorized capital of other organizations, z_{33} is the value of sold educational literature, z_{34} is the amount of grants received for start-up projects, z_{35} is income from production and service enterprises	
5	Results of spiritual-educational and physical educational activities	z_{36} is the number of winners of art and culture competitions and sports competitions, z_{37} is the number of prize-winners of contests in the field of art and culture of the Republic, z_{38} is revenues from cultural and public events, z_{39} is the number of prize-winners of art and culture contests and sports competitions, z_{40} is revenues from cultural and public events.	

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[2] Source Developed and compiled by the authors

| 6 | Results of international cooperation | z_{41} is the number of students studying based on joint education programs, z_{42} is the number of foreign grants received in the current period, z_{43} is the amount of foreign grants received in the current period, z_{44} is the number of sent to study, internship or business trip abroad, z_{45} is the number of foreign students, z_{46} is number of members of International scientific councils, z_{47} is the number of international grants, z_{46} is the amount of international grants. | |

4. Conclusion

Algorithm for determining appropriate measures based on the method of evaluating the integration level
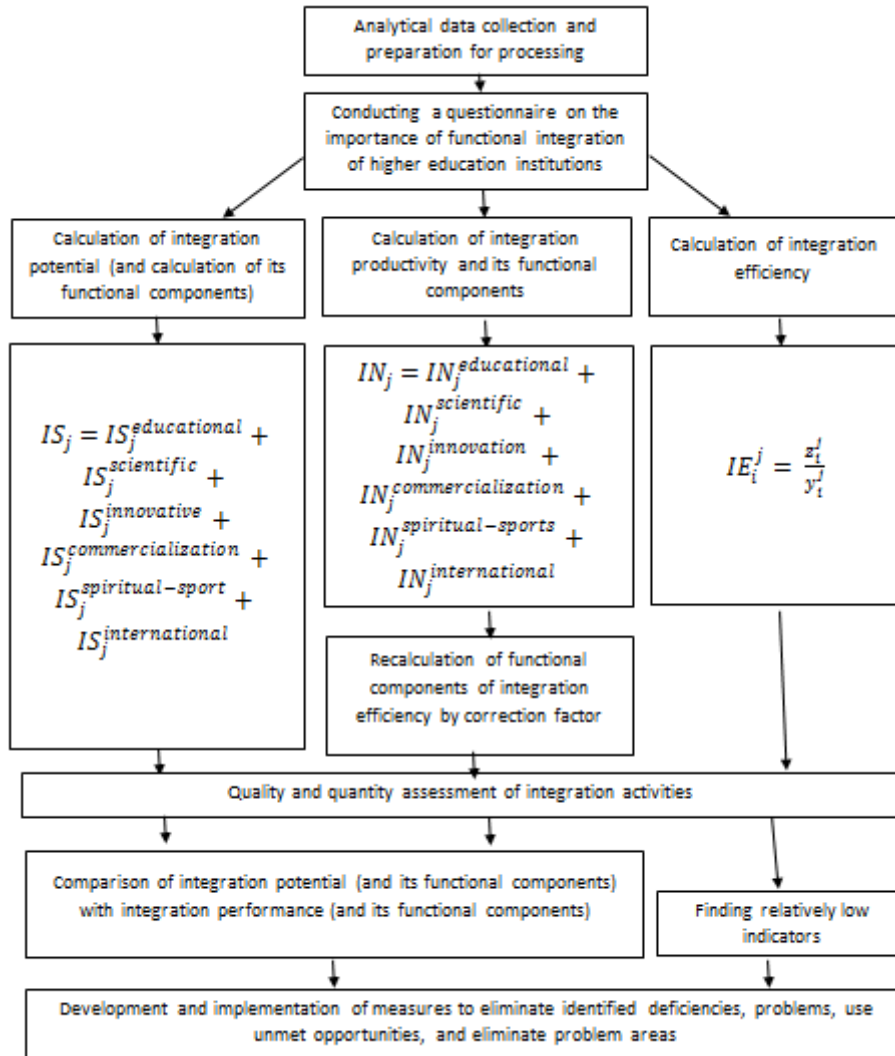
As we stated above, the significant aspect of proposed methodology is that the heads of higher education organizations responsible for making management decisions can first independently evaluate what results they are achieving using the overall integration potential, as well as whether they are able to achieve a functional result in accordance with the functional potential.

References

1. A.M. Magrupov. (2017) Improving the mechanisms for integrating strategic and functional management in the higher education system. Dissertation for the degree of Doctor of Pedagogical Sciences. Tashkent - 2017, page 17.

2. E.B. Mikhailova. (2012) The mechanism of integration of universities into the innovation infrastructure of the region. Dissertation for the Candidate of Economic Sciences. page 45.

3. I.I. Dyakov, N.A.Tretyak, (2018) Assessment of the innovative environment of universities.

4. N. V. Panevina. (2006) Integration of new and adaptation of existing quality of education into the

overall management structure of the university. Dissertation for the degree of candidate of economic sciences. p. 26.

5. M.G. Kokorev. (2006) Integration of the university and industrial enterprises in the training of future specialists. Dissertation for the Candidate of Pedagogical Sciences., Page 45.

6. O.S. Gaponova, S. V. Smeltsova, Yu. Yu. Chilipenok. (2020) Integration of higher education organizations to solve the problems of socio-economic development of regions. Economics of the region, V.16, no. 4, p. 1150.

7. O.Vorozhbit, V.Krivoshapov, (2014) Improving the indicators for assessing the integration of university science into the national innovation system. https://fundamental-research.ru/ru/article/view?id=35643

8. P.V. Efremova. (2015) On the issue of assessing the integration potential of the university: world and domestic experience in the formation of a system of indicators. Far Eastern Federal University

9. S.K. Bishimbaeva, K.K. Nurasheva, A.A. Nurmukhanbetov. (2017) Key Evaluation Indicators and University Innovation Criteria as Elements of a Quality Management System, International Research Journal, No. 11 (65), Part 4, November, p. 136.

10. https://www.kpms.ru/General_info/EFQM_model.htm.

11. https://www.kpms.ru/General_info/Baldrige_Award.htm.

12. https://www.iso.org/ru/iso-9001-quality-management.html.