

Quantitative indicators model for universities activity quality assessment

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Abstract – *The study examines the key sphere of higher education aimed at improving the quality and relevance of higher education; outlines which external quality assurance systems and major ratings currently exist in higher education, how these systems and rankings function, what consequences can be identified; critically compares quality guarantees and ratings; studies methodological approaches to the formation of an integrated system for assessing the achievement of target indicators of the university. Based on the analysis possible policy options regarding quality approaches are presented. An estimation model of the training activity based on the numerical index and a set of target indicators is presented.*

Keywords – *university, quality management system, key performance indicators, functional and process approaches*

I. Introduction

1.1. The relevance of the research topic

At present, quality assurance and ratings are used as key tools in improving the effectiveness of higher education worldwide.

This approach determines the need to analyze the latest achievements in the field of qualitative approaches in higher education. The basis for this approach is the study of the federal state requirements to higher education, integration of the process and functional approaches, information flow maps. The Russian policy in the field of higher education attaches increasing importance to the improvement of quality of the proposed education. Therefore, the assessment of training activities is particularly relevant for universities because a guarantee of the quality of the provided services means ensuring not only the professional skills of their teaching staff, but also the quality of education.

Higher education institutions assume great responsibility in the training of students; therefore, they need to develop procedures for evaluating the work of the teaching staff, training and incentives, thereby, guaranteeing their

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professional skills and competences in training. The educational activity, which is a subject of evaluation, is a process carried out both inside and outside the institution and is a tool for achieving goals and development of the abilities defined in the curricula. Educational activities include coordination and management of training, introduction of teaching methods, training and assessment, and, finally, the review and improvement of the conducted procedures. Consequently, the activity of pedagogical personnel involves various procedures aimed at organizing, coordinating, planning and teaching students, as well as evaluating their learning progress. These activities make it possible to achieve strategic goals of training and development of competences, which must be mastered by students. The assessment of educational activities should take into account all ongoing procedures and assess their magnitude and quality both quantitatively and qualitatively.

1.2. The purpose, tasks, object and subject of the study

Purpose is to conduct a study of the theoretical base of the research and to form a model for assessing the performance indicators of the educational institution.

Tasks of the study:

- to describe theoretical aspects of the study of the university's activities;
- to form a methodological topic of the research;
- to form a model for assessing and improving the activity of the university.

The object of research is educational activity of the university.

The subject of the research is a methodology for assessing the educational activity of the university.

The structure of the work is determined by the topic, the goal and the objectives of the study.

II. Literature review

In modern economic conditions the system of quality management of higher educational institutions is implemented on the basis of GOST R ISO 9001-2015 (ISO 9001: 2015) [1]. This system relies not only on the requirements of end users, but also takes into account the wishes of other participants, who are represented by state organizations, local governments, professional communities and others. In addition, the practice of development of universities includes the development programs with the duration of five years, which determine the development of the university in conjunction with a strategy that includes a mission, a vision, goals and objectives of the strategic level, target indicators and stages of their achievement.

2.1 Use of KPI – quantitative indicators + Balanced Scorecard

Universities are regularly monitored through the gathering of primary data, the analysis, the modeling of premiums and competitions. This solution allows to form a quality management system of the university relying on a higher standard: GOST R ISO 9004-2010 "The management of achieving a sustainable success of the organization. The approach is based on quality management"[2]. The key recommendation of this standard is the development of key performance indicators of the organization, which make it possible to set measurable strategic targets for the development of the organization that can be quantified to monitor and to prepare development forecasts. This approach enables to take corrective actions to improve the effectiveness of the university. Therefore, the optimal solution would be

the use of key performance indicators (KPI) – quantitative indicators, which enable us to assess the success of the organization for future forecasting. The generated KPI system can be used as a tool for achieving strategic goals and making optimal decisions to achieve them. This approach makes it possible to focus the attention of managers on the most significant aspects of development [13].

According to the research of A. Molvinsky's, the world management uses a large number of quantitative indicators. Among the Russian enterprises the most common is the classical approach, which is based on the use of the list of financial indicators and the system of the Balanced Scorecard (BSC) [8]. For universities it is difficult to use financial indicators, which include an assessment of financial performance, profitability and financial sustainability. BSC, as a rule, is used to develop and achieve the strategies of business organizations, while the use of this system in non-profit sector is limited.

In his work I.N. Baranov notes that for the determination of achievement of strategic goals it is possible to use the KPI system for both commercial and state organizations [3]. This provision is supported by the conclusions in the works of E.A. Knyazev and A.K. Klyuyev, who describe the application of the BSC system by Russian universities. But one should also take into account the fact that most universities use the development of a "goal tree" and strategic planning [11]. Therefore, the use of the KPI system will improve the effectiveness of achieving the strategic indicators of the university.

Trubilin A.I., Grigorash O.V. note that the study of performance indicators of the university makes it possible to conclude that the existing control systems "as is" have common features and can be typed for later research. Then, within the framework of a model system, an integrated system of indicators can be developed that takes into account the characteristics of activity. Traditionally this system includes the following aspects: educational, pedagogic, scientific and methodical [12].

V.G. Yeliforov and V.V. Repin pointed out that for the development of a system of performance indicators it is necessary to carry out the decomposition of management processes. Accordingly, the indicators of managerial processes can be included in the overall system of evaluation of the organization, which is already used by the university [5].

The problem of determination of optimal strategy for assessing the effectiveness of the educational process in higher educational institutions is now widely described both in the scientific community [2-5] and in journalistic studies [7,8]. In modern conditions, it is necessary to emphasize that the domestic education system does not have an effective evaluation system, because the existing evaluation system uses separate quantitative indicators.

The quantitative indicators that are used for the description are presented in the "Protocol on monitoring the activities of state educational institutions in order to assess the effectiveness of their work and reorganization of universities" [11]. The use of this protocol includes the application of six basic indicators for the assessment of the university or its branch.

In order for the university or its branch to be considered successful, it is necessary to reach target indicators of 50% or more. It should be taken into account that these indicators do not reflect the achievement of a qualitative level of the university's development, since the approach taken by the Ministry of Education does not take into account the established traditions and the previously achieved results [11]. In addition, the identified indicators did not intend to receive feedback from the teaching staff or students.

2.2 Indicators used for universities that do not have the specifics of their activities

Next, we analyze the indicators used for universities that do not have the specifics of their activities, which will allow us to expand the range of analyzed higher education institutions.

1. The average score of SAT applicants who entered the university. This indicator in the approach can be used to describe educational activities of the university. It is obvious that this approach cannot be used to describe the activity of the university, since it does not consider the effectiveness of the institution's activity, but only demonstrates the level of education of applicants based on the results of the obtained secondary education, solely in the disciplines of the SAT, which are necessary for admission to the university. Accordingly, it is necessary to conclude that this indicator is cannot be used, since it distorts the objective evaluation of the educational process.

2. The total amount of income that was received from the realization of R & D for one pedagogical worker at the university. This approach supports the current situation, in which a pedagogical worker must be a scientist and actively promote scientific research. With this approach the possibility of simultaneously effective scientific and pedagogical activity is highly controversial.

The acquisition and transfer of knowledge are processes that determine the need for the development of different competences and skills. In some cases, supplementing education with scientific developments is useful, but sometimes it hinders the educational process: when acquiring the knowledge by attending basic courses of the subject it is preferable to master basic competences and knowledge, rather than to participate in scientific research, which often may not relate to the basic subject.

3. The share of foreign students. In accordance with the described provisions, this target indicator makes it possible to characterize the level of international orientation of the institution. Its practical use does not allow to form an effective basis for evaluation, since, despite a significant percentage of foreign students, the level of the educational process may not be high enough.

4. The university's income per one pedagogical worker. This indicator cannot be used to form an effective comparative base, since for the level of student satisfaction and the assessment of the quality of education from the consumer's point of view the priority is how the structure of the university's expenditures is formed, rather than the overall size or structure of income. Within the framework of the described situation this indicator performs the function of assessment of financial and economic activities of the university.

5. The existence of a sufficient number of rooms for training and research: in accordance with the provision this indicator describes the institution's infrastructure. In reality, it has an indirect effect on the quality of training, since it does not make it possible to assess the actual level of the provided facilities and equipment. Accordingly, the quality of infrastructure can be described not only by the availability of premises, but also by the level of their technical equipment.

6. The number of graduates who did not apply to the employment service within a year after receiving the university's diploma. This indicator is also indirectly related to the level of the educational process as it demonstrates the current situation on the labor market. The university can train good specialists, but who cannot be employed on the market. In addition, even in the event of problems with employment, graduates may not apply to the labor exchange.

7. The following criteria can be included in the previously described indicators: the proportion of doctors and candidates of sciences in the structure of the pedagogical staff, the proportion of the teachings staff that corresponds to the staffing table in the total size of the teaching staff. For students these indicators are not significant, since for them it does not matter who teaches them (staff member or part-time teacher), the key is to achieve an effective result from training [11].

The proposed indicators for assessing quality do not make it possible to conduct a full assessment of the educational process, since they do not reflect the impact of the existing quality factors on the educational process. Within the framework of the current provision, the Ministry of Education integrates a system of quality assessment that includes indicators obtained from the survey of students regarding the effectiveness of higher education.

Accordingly, it must be concluded that the used approach to assessing the quality of education is ineffective. Next, we will consider the existing provisions for improving the effectiveness of the education system in the Russian Federation.

2.3 *Grigorash scheme for assessing the system of higher education*

In his study O.V. Grigorash proposed the following scheme for assessing the system of higher education [4]:

- the level of scientific and pedagogical personnel (for this segment a score system is proposed that will take into account the following indicators: age, the length of pedagogic service, the level of education, scientific activity, periodicity of publications, wage rate of the teacher);
- the availability of material and technical basis (in accordance with this position the author proposes to include two indicators in the assessment: the total size of premises used for educational and scientific activities and the specific weight of the cost of equipment per student. These indicators are assessed in accordance with the statement of the university's fixed assets);
- research activities (this indicator includes the sum of the following indicators: grants, publications in periodicals, the level of protection of dissertational research) [4].

In addition, the author offers the assessment of the level of training of students (through testing) and the evaluation of professional training of the teaching staff (using two indicators: the assessment of the effectiveness of student training and individual examination of each lecturer by using similar tests with limited time).

In addition, it is proposed to introduce the criterion of "student activity" in terms of scientific, research, sports and mass events, as well as a subsequent employment of graduates. It is also necessary to include the provision of mandatory feedback about the work of graduates to describe their professional qualities and competencies using a five-point system and the development of activities to improve the educational process.

The developed recommendations regarding the assessment of effectiveness of the university make it possible to create a more effective evaluation system than the current system presented in the Ministry of Education of the Russian Federation, but the range of indicators has a controversial structure and duplicates the indicators used in the Protocol [4].

2.4 *Ivanchenko multicomponent system to present an assessment of the quality of education*

Another approach is proposed by I.V. Ivanchenko [6], who proposes to present an assessment of the quality of education by using a multicomponent system that takes into account:

- strategic level of education;
- the level of quality of the educational process;
- the quality of management operations.
- In this study it is necessary to emphasize the factors that determine the quality of education:
- the level of services at the university;
- the degree of effectiveness of the developed courses;
- qualification characteristics of the teaching staff;

- the degree of effectiveness of research activities;
- the use of research work in training;
- optimization of scientific research in education;
- availability of sufficient literature;
- integration of information processes into education;
- the degree of provision of production and pre-graduation practices;
- optimization of the schedule of educational process;
- regulation of the workload of students and lecturers [6].

2.5 *Holistic system criteria for usage in the educational quality system:*

- the quality and effectiveness of the educational process: the system of graduation, the load of the teaching staff, the level of training, the availability of jobs for graduates, the development of graduates;
- the quality and effectiveness of scientific activity: the number of publications, the level of citations, qualification level of research.

When considering internal assessment systems it should be noted that none of the reviewed institutions has its own system for assessing the quality of the provided educational services, but quality departments are operating within the organizational structure of educational institutions. Therefore, it is necessary to make a conclusion that it is not typical for Russian universities to use a holistic system for assessing the quality of education, although there is an understanding of the need to develop and implement appropriate target indicators for raising the level of the educational process [5, 6, 11].

2.6 *Foreign target indicators for assessment of educational process*

To form an assessment system and determine really effective criteria for describing target indicators of education at the university we will further examine the indicators that are highlighted in the foreign studies:

- the effectiveness of educational process, which takes into account the fact that educational process is structured and optimized through an effective distribution of disciplines [14];
- the effectiveness of lecturers in the system of traditional education, which includes the transfer of knowledge to students, the development of competencies and skills, ensuring the acquisition of basic knowledge, the formation of basic concepts in the field of education [15];
- the efficiency of workload optimization (the workload takes into account the knowledge and experience of lecturers) [16];
- the effectiveness of training schedules (taking into account the possibility of learning by eliminating double classes) [17];
- the use of optimal information and software solutions to improve the effectiveness of the educational process and the use of innovative solutions by lecturers [18];
- potential practical use of the theoretical knowledge and skills, which involves the integration of contextual education and obtained practical skills; the training base has the optimal conditions for the training of students by synchronizing the study of disciplines by students [19];
- the improvement of scientific work (improvement of the activity of laboratories, provision of material and technical support, publication of scientific papers, participation in work groups dedicated to scientific research) [18];

- the increase in the creativity of training through the introduction of updated training systems;
- the integration of monitoring systems to assess difficulties in decision-making and minimization of interim solutions;
- the increase in the effectiveness of the fight against corruption;
- improvement of the control of educational process through the introduction of indicators at various levels: informal monitoring, which allows to ensure the growth of the quality of education through the creation of work groups and optimal procedures;
- optimization of control over the knowledge received by students;
- an effective management system at various levels of the educational process: departments, faculties, university [20];
- the existence of a system of psychological support for dealing with crisis situations;
- the possibility of inclusive education by providing the necessary conditions;
- realization of students in the practical sphere [20].

III. Research Methodology

This research is aimed at presenting the existing systems for assessing and assuring quality, critically examining them in a comparative perspective, presenting significant impacts (as much as possible) and outlining the possible policy to support the development of transparent quality assessment and a system of ensuring reliability in the future.

The methodological base of the research is based on various initiatives and strategies related to improving the quality of educational processes at the university. In general, the improvement of quality in higher education requires concrete actions, initiatives and norms in the field of quality assurance - one of the main pillars of the Bologna reform. In addition to ensuring quality, the global rankings of universities in the last decade are becoming increasingly important throughout the world.

3.1 Selection of systems of quality assurance and ranking

Considering the limited availability of research literature on internal quality control, the study concentrates on external quality assurance systems and related functions at the national and European levels. The guiding principles for selection were the geographical distribution and the type of approach to quality assurance. With regard to the approach to quality assurance we analyzed the systems of assessment, accreditation and audit. Additional criteria, which were taken into account in creating a sample of the country, include the size of the higher education sector in accordance with the number of students, the availability of data and other characteristics [21].

3.2 Laboratory research of systems of quality assurance and ranking

In accordance with the research questions we developed an analytical framework indicating the dimensions that should be analyzed for the assurance of quality and ranking. The research of the external quality control is based on systematic descriptions of the selected national systems, which resulted in comprehensive country reports included in the annex. Country reports correspond to a standardized structure oriented towards the institutional structure, applied procedures, quality indicators and possible evaluation results [22].

Strategic indicators, trends and problems are considered in separate sections of the subsets on quality assurance. In terms of quality assurance, the organizational framework and methods of ranking are analyzed in detail with special attention to quality indicators.

3.3 *Comparative assessment*

The comparative assessments were made on the basis of desk research of the systems of quality assurance and ranking. The comparative analysis in the chapter "Quality Assurance" is mainly based on the analysis of the country level compiled from country reports and the structure of the overview table based on reports of the results in Bologna. In addition, special research literature was used to substantiate the results. As for the reviewed ratings, they are compared with several key indicators and are displayed in tabular format [23].

3.4 *Structured expert interviews*

To collect first-hand information and information about the expected impacts, trends and problems, structured interviews were conducted with quality assessors and appraisers. For these interviews a flexible approach with the use of structured interview techniques was chosen. This made it possible to solve some aspects of analytic structure that are less covered by desk research and to discuss additional topics. As there was practically no impact on quality assurance, interviews were held mainly with representatives of this field to fill the existing gap [24].

3.5 *Verification of results and quality control*

To ensure the overall quality of the study and to avoid the inclusion of incorrect results, three rounds of feedback were conducted. Firstly, high-level academic experts in the field of quality assurance and ranking provided feedback on the methodology of the study. Secondly, all relevant quality assurance agencies confirmed the findings of the country reports; some suggested improvements. Thirdly, the above-mentioned high-level experts reviewed the draft report, in particular the chapter on quality assurance and ratings, as well as the subsequent comparison.

In addition, the study focused on key ratings and external quality control. The assessment of joint programs is becoming an important topic under consideration in other projects and initiatives financed by the state. The evidence of the impact of quality control is not enough, therefore interviews were conducted to obtain the first information about this [25].

The framework of quality assurance allows national systems to adopt substantially different approaches. Therefore, the comparison of systems was complex and it should be done through a limited set of measurements. This is also true for comparing the general approaches used in quality assurance and ranking. Therefore, the approaches were analyzed separately before they were contrasted with respect to their main characteristics.

3.6 *The main types of approaches adopted by the external quality control* [13]:

- Evaluation processes that are focused on improvement and on the strengths and weaknesses of the program or institution, which usually leads to recommendations on improvement.
- Approaches to accreditation, which determine whether a program or institution meets a certain standard usually leading to a yes/no decision.
- Audit, which focuses on the assessment of the system of internal quality assurance in the institution, emphasizing its strengths and weaknesses.

The assurance of quality can have different purposes. The two most common ones are accountability and improvement. Most approaches to quality serve or try to serve both of them, although with different focuses and priorities. Therefore, it would be a mistake to consider quality assurance as a form of "control" or "inspection".

Indeed, "a successfully implemented quality assurance system will give information to provide the institution of higher education and the public with the quality of activity (accountability) of the institution of higher education, and will provide recommendations on how this can improve what it does".

3.7 Subsections of assessment and accreditation

The assessment and accreditation can be applied at the program or institutional level. In the first case, the agencies of external quality assurance examine in detail each envisaged program, whereas in the case of an institution the focus is on the institution as a whole while the responsibility for individual programs is delegated to the agencies themselves.

In particular, the following subsections:

1. The analysis of the "scope of assessment" and quality criteria, which are used in the review.
2. The "measurement scale" solves the problem of how various quality criteria are tested (for example, "fulfilled" or "not fulfilled").
3. The participation of stakeholders in the quality assessment.

As for the scope of evaluation, many criteria are similar for both the program and institutional levels. Specific for institutional assessments are quality indicators related to the institutional strategy and institutional quality policy, as well as the appropriate procedures for their practical implementation. Specific program evaluation is described in detail in the concept of implementation of a specific program.

3.8 Quality criteria for program evaluation:

- The content of the program
- The expected results of the training
- The program's feasibility, the achievability of the results of training
- Other: equality, consideration of special needs of students with disabilities, etc.,

3.9 Specific features of the programs

At the institutional level there are the means for describing and certifying a particular profile of the institution applying mostly additional quality criteria.

One can distinguish two main types of ordinal measuring scales. The first group of scales is oriented to meet the requirements and usually has three possible values. The worst possible rating indicates that a certain criterion has not been achieved. In addition to the positive and negative values, there is usually a third possible value, such as "partially fulfilled" or "positive with certain conditions".

Considering the planned or recently implemented changes, a trend could be observed from programmatic approaches to audits and institutional assessments, although this trend does not apply to all countries, and in some cases, there is a shift from institutional to programmatic approaches. It is expected that the argument in favor of institutional assessment will mean that they allow for greater flexibility and responsibility at the institutional level due to the

increased institutional responsibility, facilitate the creation of quality culture at institutions. Strengthening has become a priority for almost all institutions regardless of whether they conduct assessments or accreditations.

3.10 Tasks for the formation of KPI activities

For the formation of KPI activities of the university it is necessary to ensure the solution of the following tasks:

- a large number of target indicators describe various performance indicators, among which it is necessary to highlight the management of the main and supporting processes of the quality management system. These indicators should describe the final result of the process;
- To distribute responsibilities in order to achieve key performance indicators of the university.

3.11 Model for assessing the learning activities

This document presents a model for assessing the learning activities based on international recommendations in the national and institutional context. The model of assessment is complete, accurate, adequate, universal and easily measurable. The assessment models of learning activities, such as those presented here, are extremely useful tools for university administrators to monitor the quality of teaching and to develop plans for continuous improvement. On the other hand, the growing need to develop plans for recognizing the activities of the teaching staff means that the use of models such as this one is becoming increasingly necessary. Finally, it should be noted that the use of educational assessment systems makes the teaching staff increasingly take into account the criteria that are considered by these systems. Therefore, teaching staff are encouraged to analyze the adequacy, satisfaction, efficiency and innovation in training creating a quality culture in relation to learning activities.

Subsets of the model include three areas of assessment (planning, development and achievement of results) based on the criteria of satisfaction, effectiveness and use of innovations in training. The objectives of the model include: improvement of the quality of the teaching and methodological process, recognition of the training activities and development of educational policies at the institutional level.

IV. Results and discussion

The scientific study of M. Cowan makes an assessment of the possibility of using the matrix of Paul Harion, which adopts a functional-process approach [7]. When this strategy is applied vertically the management of functions is represented, and when horizontally – the management of the processes. Based on the approach of this study a matrix was formed to integrate the optimal quality indicators of the university for the formation of the common system. All indicators for assessing the activities of the university can be divided into 3 key groups [7]:

1. Group A includes indicators that determine the strategic development of the institution.
2. Group B unites those indicators that were identified according to the results of the research of maps of information processes;
3. Group C systematizes target indicators defined by the state educational standards [7].

All of the above sets intersect, which allows the same indicators to enter into different sets. Further, we systematize the groups of indicators into separate subsets of the block matrix (Table 1).

Table 1. The matrix of distribution of indicators according to processes and responsible managers

Processes	Heads of institutions								
	High			Middle			Lower		
Process 1	Π_{11}^B		Π_{1n}^B	Π_{11}^C		Π_{1n}^C	Π_{11}^H		Π_{1n}^H
Process 2	Π_{21}^B		Π_{n2}^B	Π_{21}^C		Π_{2n}^C	Π_{21}^H		Π_{2n}^H
.....									

Each cell of the matrix is given a value, which makes it possible to avoid the repetition of indicators and to form the groups of subsets that do not intersect. It should be taken into account that different subsets of target indicators will be filled for the managers of different levels. Using this approach, we will decompose and describe the two main processes of the university and two heads of the university of different levels:

1. The first subset refers to the head of the higher level and the first process
2. The second subset refers to the middle-level manager and the second process.

Within the framework of the research the following type of activity will be assigned to the first process: "Planning and development of the basic educational program" [26]. This process is over-arching and affects the activities of various structural units at the following levels: strategic development of the university, faculties and departments.

The second process is "Pre-university training", which is a functional subset and is realized with the help of the dean's office responsible for the implementation of pre-university training. Based on the outlined strategy of the university we decomposed the main strategic tasks, which affect the final results of the university's quality management system (Table 2).

Table 2. Decomposition of indicators of strategic tasks and the processes of the university's quality system

Processes	Target indicators	Responsible persons
Planning and development of educational programs	<p>A1.1.2 The number of curricula complying with the Federal State Educational Standards</p> <p>A1.2.1 The number of competitive basic educational programs of the university</p> <p>A 1.2.2. The number of training specializations of masters</p>	Vice-rector for educational activity

	A. 1.1.2 The number of working plans	Deans
	A.1.2.1 The number of new competitive basic educational programs	
	A.1.1.2 The number of curricula at the department	Heads of departments
Pre-university training	A.2.2.1 The number of areas of training in the form of e-courses	
	A.2.2.2 The number of activities devoted to career guidance	
	A.2.2.3 The number of schoolchildren who attended career guidance activities	
	A.2.2.1 The number of enrollees who took part in career guidance activities	Dean of the Faculty of Pre-university training

The differentiation of indicators of sub-processes between managers was presented based on information maps of the university's processes, (Table 3).

Table 3. The distribution of indicators of the process goals among the responsible managers

P rocesses	Measured values for the indicators of process goals	Responsible persons
Planning and development of educational processes	Implementation of Educational and Methodical Complex of Discipline within the framework of normative indicators	Vice-rector for educational activity
	The percentage of provision of educational activities with Educational and Methodical Complexes of Disciplines	
	Student satisfaction with Educational and Methodical Complexes of Disciplines	
	The compliance of Educational and Methodical Complexes of Disciplines with regulatory requirements and meeting the wishes of stakeholders	Deans
	The compliance of Educational and Methodical Complexes of Disciplines with regulatory requirements and	Heads of departments

	meeting the wishes of stakeholders	
P re- university training	<p>The percentage of enrollees who took part in career guidance activities</p> <p>Satisfaction of participants of the training courses</p>	Dean of the Faculty of Pre-university training

As a result of the formation of subsets that relate to certain managers and processes there occurs an integration of the data from Table 2, which includes a description of the measurement of achievement of strategic tasks and processes, and the data from Table 3, which form process goals [27].

It is necessary to pay attention to the formation of the strategy of development of information cards of processes for which the requirements of the federal educational programs and the requirements of the Federal State Educational Standards are applied. In addition, one has to keep in mind that for subsets it is necessary to choose such indicators that will characterize the described processes and managers responsible for the effectiveness of this activity. Therefore, it is necessary to create a final summary table.

In conclusion, one evaluates the indicators that are indicated in the cells of the table. This approach will eliminate the use of duplicate indicators within each subset. It is also advisable not to take into account the indicators that describe the process, instead of the final result. We will compile Table 4, which includes all subsets of indicators that can be assigned to the target performance indicators.

Table 4. Key indicators of the university activity distributed by processes and responsible managers

Key indicators of the university activity	Res ponsible persons
Process “Planning and development of the basic educational program”	

1. The number of basic educational programs in the institution that were developed within the framework of compliance with the Federal State Educational Standards. 2. The number of new basic educational programs. 3. The number of master's programs. 4. Conformity with the structure of development of basic educational programs. 5. Fulfillment of the terms and labor intensity relating to basic educational programs of the university. 6. The percentage of classes provided with curricula. 7. Ensuring students' access to Educational and Methodical Complexes of Disciplines. 8. Conformity of Educational and Methodical Complexes of Disciplines of the university with the requirements of the Federal State Educational Standards. 9. Student satisfaction with the educational process.	Vice-rector for educational activity
Process "Pre-university training"	
1 The percentage of admissions to the university after the completion of preparatory courses. 2 Satisfaction of participants of the training courses.	Dean of the Faculty of Pre-university training

The system of KPI indicators (Table 4), which was formed within the framework of the study, can be supplemented by collecting other indicators and data about the university's processes in all areas of its activity. This strategy is realized in the annual reports on the activities of the university, which include the results of the conducted activities, their duration and effectiveness [28].

V. Conclusion

Based on the results of the study it is possible to make a conclusion that the indicators of the university's performance are directly interrelated with the setting of its goals. As part of the work we formulated approaches to the formation of goals in the system of quality management.

Based on the study of theoretical works it was concluded that it is necessary to apply the management approach "Management according to goals", in which the goals of the higher educational institution involve a top-down processing and the use of the process approach focused on the end-user. Within the framework of the process approach the goals are determined by the internal consumer, who can be represented by process owner or process employee.

The KPI system of a higher educational institution makes it possible:

- to eliminate duplicate indicators;

- to differentiate responsibilities among the managers of different levels;
- to optimize the manageability of the system of quality management of the educational organization.

The proposed KPI system makes it possible to assess the management system of the university in accordance with the following principles: initial setting of goals and evaluation of target indicators after their achievement. This approach will make it possible to carry out the management of the university on the basis of the main principles of quality management.

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