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V. PITERSKA, O. LOHINOV, L. LOHINOVA

MECHANISM FOR FORMING AN EFFECTIVE PORTFOLIO OF RESEARCH PROJECTS OF INSTITUTION OF HIGHER EDUCATION

The **subject** matter of the article is the methods, models and mechanisms of forming a portfolio of research projects of higher education institutions. The **goal** of the work is to develop a mechanism for managing a portfolio of research projects of a higher education institution based on the commercialization of the results of scientific activities of the university based on a risk management system. The following **tasks** were solved in the article: analysis of the scientific management model of higher education institutions, the study of modern methods of managing portfolios of research projects of universities, the development of a mechanism for the formation of an effective portfolio of research projects of higher education institutions taking into account risks and the commercialization of scientific results. The following **methods** used are – project and portfolio management methods, systems theory and systems analysis, risk management methods. The following **results** were obtained – the mechanism for creating a portfolio of research projects taking into account the strategic goals of a higher education institution was developed, a consolidated plan for the implementation of scientific projects of a portfolio was created, a mechanism for managing a portfolio of research projects of a higher education institution was developed based on a grouping of projects according to risk criteria and the commercialization of scientific results. **Conclusions**: using the portfolio management mechanism will allow higher education institutions to form balanced portfolios of scientific projects, thereby more effectively implementing innovative programs taking into account risk criteria and the commercialization of scientific results. The most difficult task of the scientific project management system is the task of forming a portfolio of research projects. The portfolio of research projects of a higher education institution is valuable if it allows you to develop activities aimed at creating and strengthening competitive advantages. However, the university's capabilities in terms of forming a portfolio of research projects are limited by available resources, as well as by the increasing complexity of developing the latest technologies that require the involvement of third-party organizations, because the possibilities of establishing a higher education for independent conduct and processing of the results of scientific activities are limited. At the stage of selection of research projects, a list of current projects is formed; an analysis of research projects in the portfolio is carried out for compliance with the strategic goals of the institution of higher education. By grouping research projects in a portfolio and forming the necessary criteria for the projects to correspond to a particular group (direction) of scientific research, the projects are linked both with each other and with the goals of a higher education institution, and the transparency of the formed portfolio of research projects is increased. At the stage of balancing research projects, resources are allocated in accordance with the directions of research projects and the objectives of the portfolio of projects of higher education institutions. At the same time, the portfolio should increase the share of research projects with high value for higher education institutions and the share of projects designed to bring higher education institutions dividends from the commercialization of scientific results (patent implementation) and reduce the share of high-cost research projects, as well as projects with high risks. The following criteria are used as the main criteria in balancing the portfolio of research projects of higher education institutions in work: expenses for the implementation of research projects; the value of projects for higher education institutions; project risk; proportion of projects in the portfolio.

Keywords: research project; project management; higher education institution; portfolio management.

Introduction

The modern reform of higher education suggests that within the new concept of University education and the evaluation system of indicators of efficiency of higher education institutions one of the defining factors of competitiveness of institutions of higher education is the intensification of scientific-research activities scientific-pedagogical staff [1]. This necessitates the creation of conditions for the development of scientific research activities in the institution of higher education, namely: commercialization of scientific activities of institutions of higher education, improving the quality of scientific training and the level of implementation of scientific results, the accumulation of research capacity of higher education institutions, participation in international and national research programmes and grants. Thus, the priorities for the development of institutions of higher education should be efficient management of research activities of the University on the basis of the implementation of planning, organization, control, coordination and intensification of research work with the University in General and structural subdivisions (institutes, faculties), teaching staff of departments, graduate students and students.

The indicators of the effectiveness of the higher education institution's scientific activity characterize the impact of the results of the scientific activity in three aspects: the influence of the results of the scientific projects of the higher education institution on the development of science (scientific effect); influence on the educational process (scientific-educational effect); influence on practical activity of organizations (scientific-business effect).

The institution of higher education is characterized by the following scientific projects: strategic scientific projects, which main purpose is the development of the organization, increasing the competitiveness of the higher education institution in the market, modernization and improvement of existing processes, production capacities of business structures; basic scientific projects within the framework of which the tasks on the basic (educational, methodical, organizational) activity of the higher education institution are solved. The process of implementation of scientific projects in a higher education institution has several features, the main of which are the following: specific hierarchical structure of the system of management of scientific activity of a higher education institution; priority in the implementation of scientific projects on the request of the super-system (for example,

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the Ministry of Education and Science or other agency); non-commercial nature and budget financing of most scientific projects; a significant degree of external uncertainty in determining the goals of implementing long-term and medium-term scientific projects, as well as in the content requirements of the supersystem by the structure and content of training of specialists; the distribution of most of the scientific potential by educational and scientific units (faculty and department). The main purpose of managing scientific projects in a higher education institution is to provide the required level of quality of results with fixed (or changing) parameters of the social contract for the training of specialists and basic types of resource provision of a higher education institution (material, technical, financial, organizational, personnel, scientific) -methodical, regulatory and informational) [2]. Currently, integrated systems of scientific activity of higher education institutions have, as a rule, not one, but a whole set of scientific projects in many areas of scientific activity in order to increase their level of competitiveness. Due to the multiplicity of projects, which are not always coordinated, there is a need to systematize the activities of the higher education institution in order to use resources more effectively and achieve the strategic goals set in the framework of the implementation of innovative programs.

Analysis of recent research and publications

The institution of higher education must adhere to the following principles of implementation of scientific projects within the framework of innovative programs, which cover the goals, directions, methods of selection, planning and implementation of scientific projects at the university, namely: relevance of scientific projects to the goals and priorities of the higher education institution's strategy; monitoring the goals and instruments of the higher education institution's scientific activities in order to make timely changes under the influence of a dynamic external environment; the focus of research projects on enhancing the competitiveness of higher education institutions, which places particular emphasis on the criteria of "risk" and "commercialization of scientific results" in the implementation of the mission of the innovation program; focus on creating long-term competitive advantages in the future, which requires analysis of markets in which higher education institutions compete in the implementation of innovative activities, as well as the competencies of enterprises in the field of technology and resource potential of the University, taking into account the transfer of research results to business structures; taking into account the dynamics of the external and internal environment, which requires ensuring the conformity of the decisions made by the higher education institution, the criteria for prospective selectivity, the timing of the implementation of the results of scientific projects and the methods of creating promising innovative products.

The solution of actual problems of development of organizations taking into account the methodology of project management is presented in [3]. The concept of project, portfolio, and program management as a basis for effective development of information society is given in [4].

Models for assessing the effectiveness of a project-oriented organization's project portfolio, as well as a method for forming a target space for project-oriented organizations' movement, are proposed in [5].

In [6] models and methods of project management in conditions of risk and uncertainty have been developed. Simulation of risk situations in Economics and business is given in [7]. Methods of risk assessment in innovation projects presented and developed in [8, 9]. In [10, 11] has developed a methodological framework the risk-based approach to resource management projects and programs of technological development and mechanisms of realization of strategy of diversification based on competence management of the company and its employees. The results of the study in [12], has become a compositional and modular approach to generate models of project portfolio management in the implementation of investment and innovation. Model of the initiation of the process of formation of a portfolio of projects for the development of complex socio-economic systems is developed in [13].

Modern management methods portfolios of projects and project management office are presented in [14]. Model of portfolio optimization projects of the enterprise for the planned period and the method of content optimization project on criteria profit, time, cost, quality, risks developed in [15]. A model of optimal portfolio selection of projects and artists on the basis of expert technology, as well as methods for aggregation in project management is given in [16]. The processes of project portfolio management are described in [17]. Modern methods of management of portfolios of projects are presented in [18]. Assessment components of the portfolio based on nitroformate of the model performed in [26]. Mathematical foundations of project management and portfolio of high-tech industries is given in [19]. Development of a model organizational structure of the University by means of the project management system carried out in [20-22]. Experience in the development of indicators of scientific activity of universities in the real socio-economic conditions is studied in [23, 24]. Development of methods of assessment, measurement, analysis of the development of the scientific and technical level of the industry, as well as models of project portfolio management under uncertainty is presented in [25, 26].

The most complex task of the scientific project management system is the task of forming a portfolio of scientific projects. A portfolio of higher education institution research projects is of value if it enables the development of activities aimed at creating and strengthening competitive advantage. However, the university's capacity to formulate a portfolio of research projects is limited by the resources available, as well as the increasing complexity of developing new technologies that require the involvement of third-party organizations, since the capacity of a higher education institution to independently conduct and process research outputs is limited.

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The management of the portfolio of higher education institution's research projects should ensure the implementation of the following functions: collection of initial information on scientific projects that may be included in the portfolio of the higher education institution; formation of a portfolio of scientific projects of a higher education institution that is capable of achieving the goals of the organization, taking into account available resources; evaluation and ranking of scientific projects in accordance with established criteria based on available information; ensuring the balance of the portfolio, i.e. achieving a balance between short-term and long-term projects, between the risks of scientific projects and their profitability (commercialization of scientific results); monitoring of planning and implementation of scientific projects selected in the portfolio; analysis of the effectiveness of the portfolio of scientific projects and finding ways to improve it; comparing the possibilities of new scientific projects with each other and in relation to the scientific projects already included in the portfolio, taking into account the resources of the institution of higher education in terms of the implementation of additional projects; providing information and recommendations to managers at all levels (institutes, faculties, departments) for making management decisions.

The purpose of this article is to develop a mechanism for managing the portfolio of higher education institution's research projects based on the commercialization of the results of the university's scientific activities, taking into account the risk management system.

Presentation of the main material

At the stage of selection of scientific projects, a list of current projects is formed; analysis of scientific projects in the portfolio is conducted in accordance with the strategic goals of the institution of higher education.

At this stage, in the established form and approved by the management of the institution of higher education in order, the structural units in certain terms (start of work on submitting initiatives and proposals for current scientific projects, carried out by means of the order of the head of the institution of higher education) submit their initiatives to view formed structural unit (for example, in the scientific and technical council of another collegial body), which in turn consolidates these proposals, conducts qualitative and quantitative (with the help of experts involved) and Aliso all research projects for compliance with their strategic objectives of the institution of higher education.

The initial set of scientific projects is divided into subsets of equivalent scientific projects. Research projects in these subsets may be of varying degrees of completion, the cost of research projects may be different, and resources may be used at different levels.

It is advisable to find a portfolio of research projects from an initial set of competing projects that contain only one research project from each subset that satisfies all the constraints and requirements for resource utilization, maximizing beneficial outcome and minimizing risk.

At the grouping stage, portfolio components are allocated to research projects and grouped together in accordance with the goals of portfolio management. Such goals include enhancing the competitiveness of a higher education institution, reducing portfolio risk, and achieving portfolio compliance with the strategic goals of the university. In this case, scientific projects in one area of research should have an appropriate set of criteria that can be used to judge the achievement of goals and effectiveness of management.

By grouping scientific projects into portfolios and forming the necessary project compliance criteria for a particular research group (project), projects are linked both to one another and to the goals of the institution of higher education, as well as to increase the transparency of existing portfolios of scientific projects.

At the stage of balancing scientific projects, resources are allocated according to the directions of scientific projects and the goals of the portfolio of the institution of higher education.

Balancing the portfolio of research projects involves identifying the most significant differences between the indicators of the portfolio groups and their "smoothing".

At the same time, the portfolio should increase the share of high value scientific projects for higher education institutions and the share of projects designed to bring higher education institutions dividends from the commercialization of scientific results (realization of patents) and reduce the share of high-cost scientific projects as well as high-risk projects.

Taking into account the minimization of costs and risks, the relationship between scientific projects of a higher education institution is determined (fig. 1).

It is important to consider the projects in the light of their relevance to the mission of the innovation program and the strategic goals of the higher education institution.

Research results

So, as the main criteria for balancing the portfolio of research projects of institutions of higher education can use the following criteria: costs for the implementation of the projects; the value of projects for institutions of higher education; risk of project; the share of projects in the portfolio. Within the balancing portfolio of research projects are determined the differences between groups and measures for their smoothing. Table 1 and fig. 2 show the differences in the portfolio of research projects of institutions of higher education. Fig.2 shows that the largest share in total portfolio is high-risk research projects Group 6 with a significant amount of funding, but the lowest level of commercialization of scientific results and value to the business. In this situation it is recommended to reduce funding by reducing work and costs.

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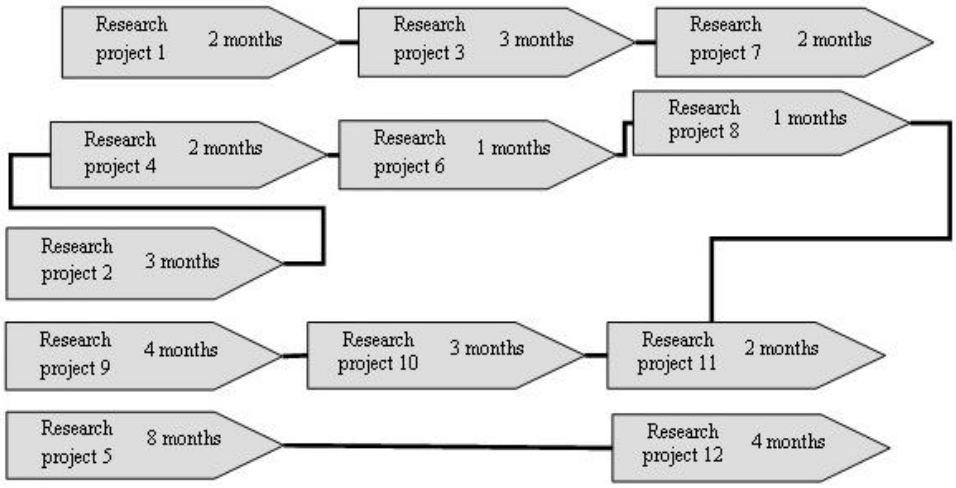

Fig. 1. Relationships between research projects

Table 1. *Indicators characterizing scientific projects of a higher education institution*

Portfolio	Total costs for the implementation of research projects in the group	Average grade of research projects in a group according to the criterion "Commercialization of scientific results of a higher education institution"	Average score of research projects in a group according to the criterion "Risk of a group of scientific projects"	Share of the group's scientific projects in the portfolio of higher education institution
Group 1	20	50	40	15
Group 2	40	80	20	10
Group 3	80	60	60	25
Group 4	100	10	80	30
Group 5	120	90	50	15
Group 6	140	50	70	5

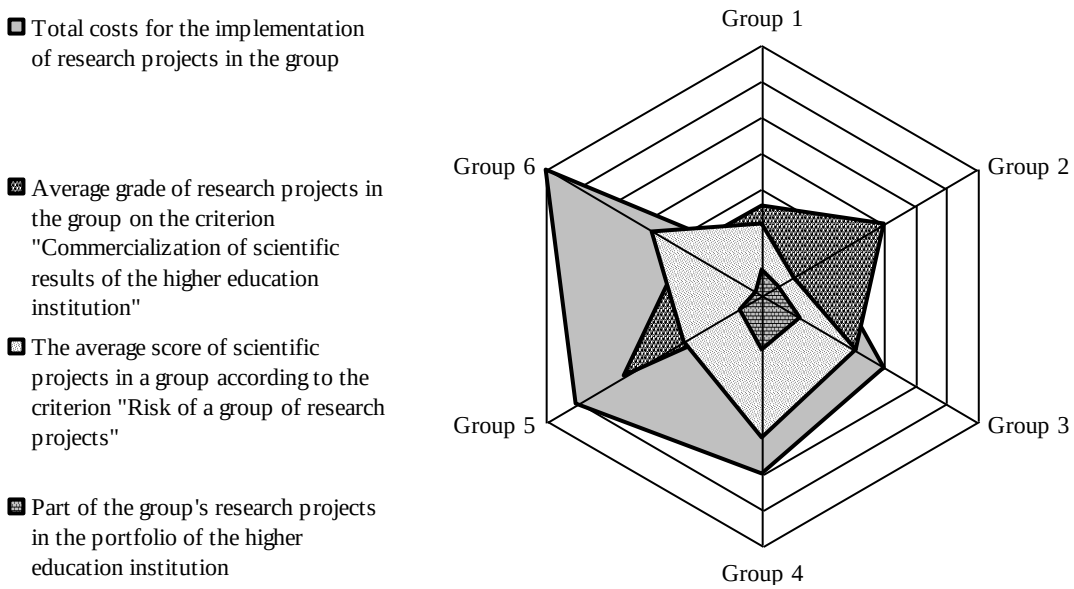

Fig. 2. Distribution of indicators by groups of scientific projects of higher education institution

Group 5 research projects are also associated with high risks and costs, and projects of this group are extremely important for a higher education institution, confirming the high weight of the group's scientific projects under the criterion of "commercialization of scientific results", which will further the ability of higher education institutions to implement business patented ideas.

In this case, it is necessary to offset such research projects with other projects with moderate risks and significant commercial effect achieved in the short term.

A significant aspect of portfolio balancing is the planning of resource provision for research projects. At the same time, it is important to take into account the timeframes for the implementation of individual scientific projects by higher education institutions within the portfolio and the times when the need for project

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financing, material, human resources, and infrastructure support emerges.

For example, the planning of financial support for a portfolio of higher education institution's research projects should be conducted in accordance with established budgetary constraints that affect the financing of the project in any period.

For visual representation, a schedule of implementation of scientific projects of the portfolio (fig. 3-7) is attached, linked to the calendar plan, indicating the time of occurrence of resource needs and sources of their satisfaction, for example, and sources of funding, suppliers of material, information, and other resources.

At the same time, every moment of time is associated with a specific contractor, which seems very valuable for further monitoring and evaluation of the effectiveness of the implementation of scientific projects of the portfolio of higher education institutions.

The result of planning is a consolidated plan for the implementation of scientific projects of the portfolio, indicating its duration, resources used and contractors.

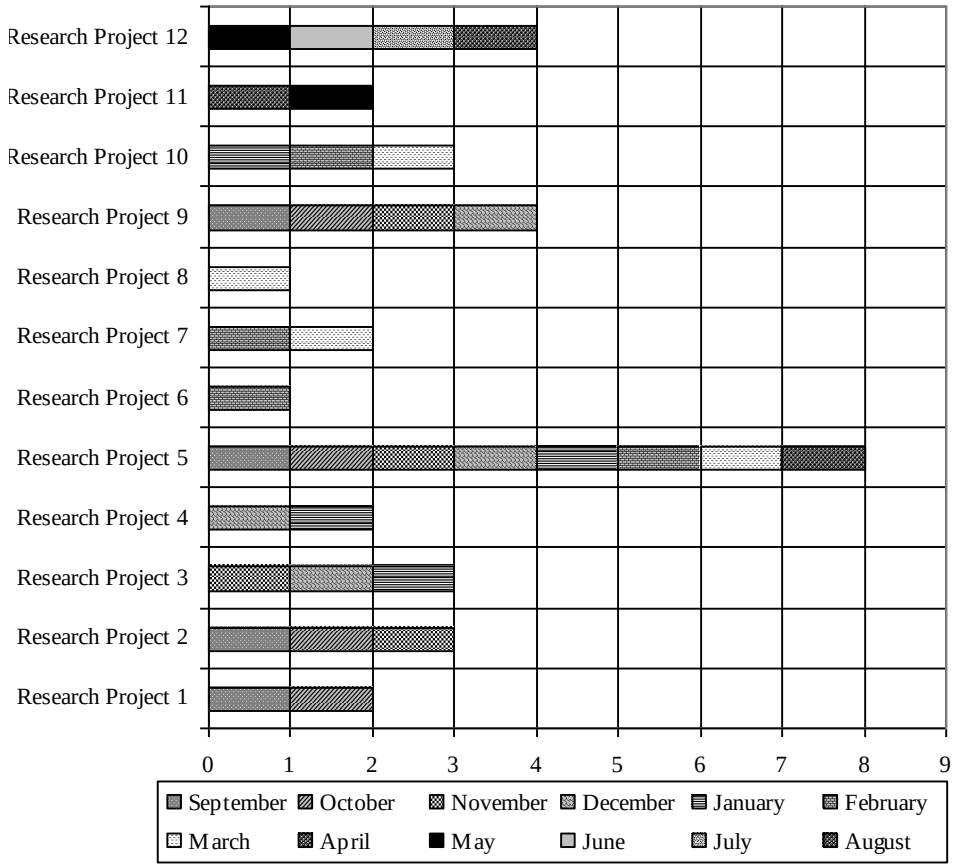

Fig. 3. Schedule of implementation of scientific projects in the portfolio of higher education institutions

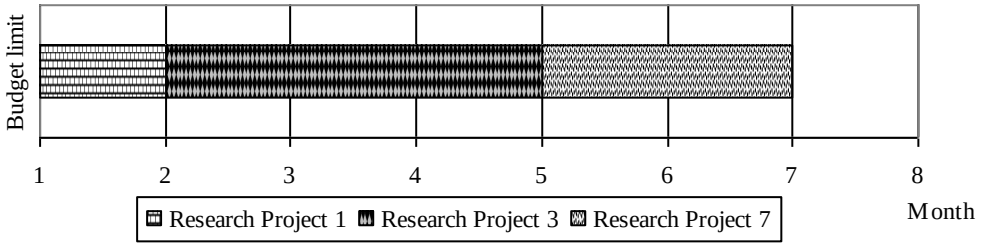

Fig. 4. Schedule of implementation of scientific projects 1-3-7

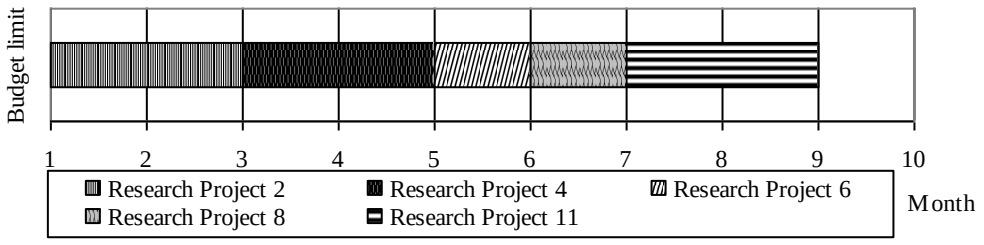

Fig. 5. Schedule of implementation of scientific projects 2-4-6-8-11

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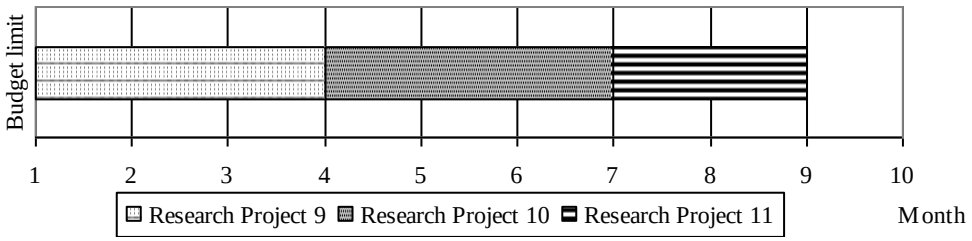

Fig.6. Schedule of implementation of scientific projects 9-10-11

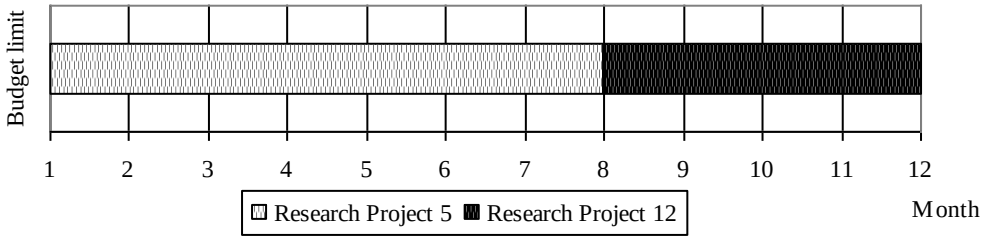

Fig.7. Schedule of implementation of scientific projects 5-12

At the stage of analyzing the effectiveness of a portfolio of scientific projects, criteria and indicators are developed, which assesses scientific projects, and then qualitative and quantitative assessment is made. The most important criteria for qualitative analysis of portfolio projects are risks, project cost (including financial, material, staffing and other costs) and commercialization of the results of higher education institution research projects. At the same time, projects in one area of portfolio research are compared to each other by a single set of criteria, which was identified at the stage of project selection and adjusted at the current stage. Each criterion is assigned a weight on the basis of which an assessment is made and a list of the most effective projects is drawn up. A balanced portfolio of higher education institution research projects should generally include projects in all areas of research.

Depending on the degree of maturity of portfolio management in a higher education institution, two approaches are defined in terms of solving the problem of evaluation and selection of scientific projects for inclusion in the portfolio.

In the first case, the institution of higher education may already have a well-developed technology of project portfolio formation. In this case, the aim is to analyze current and planned scientific projects for relevance and relevance to the strategic goals of the institution of higher education. The output of such an analysis makes it possible to make decisions about adjusting certain parameters of scientific projects, increasing their attractiveness or making decisions about changing the composition of the portfolio of scientific projects (excluding less attractive scientific projects and incorporating new, developed initiatives).

In the second case, the institution of higher education forms the portfolio of scientific projects for the first time. With this approach, the goal is to analyze the initiatives that are coming in to ensure the relevance and relevance of the university's strategic goals. The baseline data, in this case, make it possible to make a decision on the composition of the portfolio of scientific projects (the portfolio includes only attractive initiatives that meet the previously defined criteria). As the portfolio of scientific projects includes only recommended projects and in the absence of experience in forming a portfolio of scientific projects, there is a risk of falling into the portfolio of projects that do not meet certain criteria and goals of the institution of higher education. But this step is an opportunity to gain experience to form the portfolio of scientific projects more correctly next time.

In the future, using qualitative and quantitative analysis, selected the necessary research projects for a portfolio of institutions of higher education. Is an assessment of the current projects, comparing them with "custom designs" and the decision on the inclusion of selected research projects in the future portfolio. This is the most difficult stage because some of the projects will be required to withdraw for reasons of their unreasonableness. In the analysis of research projects, we should not forget about the key factors of the project portfolio. The goal of each research project must meet the strategic objectives of the institution of higher education. Time, budget, resources for research projects must be consistent with the strategic plan of the institution of higher education. Final and intermediate results of ongoing research projects will or can be used to implement strategic research projects.

Qualitative analysis is needed to select those research projects that are relevant first and foremost to the goals and strategy of the higher education institution. For example, the criteria for qualitative analysis are the innovative attractiveness, the importance of the implemented scientific project for business structures.

The result of the quantitative analysis is a feasibility study, financial and economic analysis (including key performance indicators of the project (for example, SPP). Quantitative analysis involves the evaluation of selected at the stage of qualitative analysis of research projects within the portfolio in terms of indicators characterizing the commercial efficiency and investment attractiveness of the research project.

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The main criteria for the qualitative analysis of research projects of higher education institutions are the risks, cost and value of the project for business structures (the possibility of obtaining a patent). The results of qualitative analysis of scientific projects of higher education institutions will be presented in tables 5.4 and fig. 8.

Table 2. *Qualitative analysis of research projects of higher education institutions*

Research project	Risk	Expences	Commercialization of scientific results of the higher education institution
Research project 1	3,5	3,5	0,8
Research project 2	3,2	1	1,4
Research project 3	1,6	1,7	2,0
Research project 4	3,7	2,5	2,5
Research project 5	2	1,8	3
Research project 6	1,2	3,8	3,5
Research project 7	2,5	2,2	3,7
Research project 8	0,8	4	4,2

Within the framework of this analysis, the scientific projects of one group (direction) of research included in the project portfolio are compared according to a single set of criteria. For each criterion, weighted indicators are determined. With the help of certain weights, a list of "recommended scientific projects" is compiled. The diameter of the circles depends on the cost of the scientific project – the larger is the diameter, so the larger is the circle.

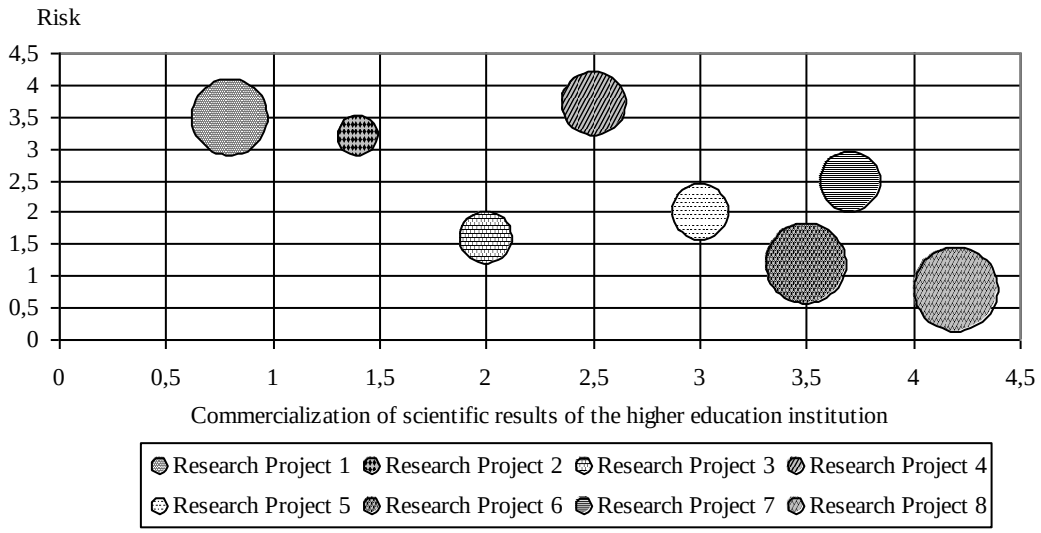

Fig. 8. Analysis of scientific projects for the purpose of portfolio formation

As can be seen from fig. 8 scientific projects "2" are valuable for a moderate-cost institution of higher education, but at the same time it is quite risky. The most costly is the 8th project, albeit with a moderate level of risk. The level of commercialization of scientific results for the scientific project "1" is small, the risk and costs are high. It is not necessary to exclude projects such as "1" from the portfolio of a higher education institution immediately. You can first try to change the basic parameters of a scientific project, such as changing goals (reorient it), or other ways to increase attractiveness. Scientific project "5", with its moderate costs and risks, is attractive to business, in which case it is clear that such projects should be included in the portfolio of a higher education institution, thus providing a possible implementation of patented ideas. Thus, by processing the entire portfolio of scientific projects, we will be able to filter out unattractive projects and concentrate the project portfolio on the most important projects.

At the stage of monitoring the portfolio of scientific projects, higher education institutions have ongoing portfolio management through the proposed systems of innovation program management, risk management. In this case, this stage should provide: maximum return on invested resources; minimizing risks; improvement of mutual understanding within the performers of the scientific project and coherence of actions between different participants; improving the accuracy of decisions; effective allocation of resources between higher education institution's research projects.

Conclusions

The use of a portfolio project management mechanism will allow higher education institutions to form balanced portfolios of research projects, thereby more effectively implementing innovative programs. Mechanisms of forming a portfolio of scientific projects of a higher education institution will ensure rapid

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adaptation of organizations to unstable economic conditions, as well as an adequate response to the risks that inevitably accompany innovation. Application of project portfolio management methodology allows determining the degree of correspondence of investments in scientific projects to the strategic goals of the higher education institution within the framework of the unified mission of the innovation program. By applying portfolio management methods, higher education institutions can better assess the risks of research projects, the benefits derived from their implementation, monitor project implementation and predict the development of the organization.

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Відомості про авторів / Сведения об авторах / About the Authors

Пітерська Варвара Михайлівна – доктор технічних наук, доцент, Одеський національний морський університет, професор кафедри експлуатації портів і технології вантажних робіт, Одеса, Україна; e-mail: varuwa@ukr.net; ORCID: http:// orcid.org/ 0000-0001-5849-9033.

Питерская Варвара Михайловна – доктор технических наук, доцент, Одесский национальный морской университет, профессор кафедры эксплуатации портов и технологии грузовых работ, Одесса, Украина.

Piterska Varvara – Doctor of Sciences (Engineering), Associate Professor, Odessa National Maritime University, Professor of the Department of Port Operations and Cargo Works Technology, Odessa, Ukraine.

Логінов Олег Володимирович – кандидат технічних наук, Одеський національний морський університет, доцент кафедри морського права, Одеса, Україна; e-mail: ologinov@ukr.net; ORCID: https://orcid.org/0000-0002-4540-731X.

Логинов Олег Владимирович – кандидат технических наук, Одесский национальный морской университет, доцент кафедры морского права, Одесса, Украина.

Lohinov Oleh – PhD (Engineering Sciences), Odessa National Maritime University, Associate Professor of the Department of Maritime Law, Odessa, Ukraine.

Логінова Лілія Володимирівна – Одеський національний морський університет, старший викладач кафедри філології, Одеса, Україна; e-mail: llv2003@ukr.net; ORCID: http://orcid.org/ 0000-0003-2263-9457.

Логинова Лилия Владимировна – Одесский национальный морской университет, старший преподаватель кафедры филологии, Одесса, Украина.

Lohinova Liliia – Odessa National Maritime University, Senior Lecturer of the Department of Philology, Odessa, Ukraine.

МЕХАНІЗМ ФОРМУВАННЯ ЕФЕКТИВНОГО ПОРТФЕЛЮ НАУКОВИХ ПРОЕКТІВ ЗАКЛАДУ ВИЩОЇ ОСВІТИ

Предметом дослідження в статті є методи, моделі і механізми формування портфелю наукових проектів закладу вищої освіти. **Мета** роботи – розробка механізму управління портфелем наукових проектів закладу вищої освіти на основі комерціалізації результатів наукової діяльності університету з урахуванням системи управління ризиками. В статті вирішуються наступні **завдання**: аналіз моделі управління науковою діяльністю закладів вищої освіти, дослідження сучасних методів управління портфелями проектів науково-дослідної діяльності університетів, розробка механізму формування ефективного портфелю наукових проектів закладу вищої освіти з урахуванням ризиків та ймовірності комерціалізації наукових результатів. Використовуються такі **методи**: методи управління проектами і портфелями, теорія систем і системного аналізу, методи управління ризиками. Отримано наступні **результати**: розроблено механізм формування портфелю наукових проектів з урахуванням стратегічних цілей закладу вищої освіти, створено консолідований план реалізації наукових проектів портфеля, розроблено механізм управління портфелем наукових проектів закладу вищої освіти на основі групування проектів за критеріями ризику та ймовірності комерціалізації наукових результатів. **Висновки**: Використання механізму портфельного управління дозволить закладам вищої освіти формувати збалансовані портфелі наукових проектів, тим самим більш ефективно здійснюючи реалізацію інноваційних програм з урахуванням критеріїв ризику та ймовірності комерціалізації наукових результатів. Найбільш складною задачею системи управління науковими проектами є задача формування портфелю наукових проектів. Портфель наукових проектів закладу вищої освіти має цінність, якщо дозволяє розвивати діяльність, спрямовану на створення і зміцнення конкурентних переваг. Однак можливості університету в частині формування портфеля наукових проектів обмежені доступними ресурсами, а також зростаючою складністю розробки новітніх технологій, які потребують залучення сторонніх організацій, адже можливості закладу вищої освіти для самостійного проведення і опрацювання результатів наукової діяльності є обмеженими. На етапі відбору наукових проектів формується список поточних проектів, проводиться аналіз наукових проектів в портфелі на відповідність стратегічним цілям закладу вищої освіти. За допомогою групування наукових проектів в портфелі і формування необхідних критеріїв відповідності проектів тій чи іншій групі (напрямку) наукових досліджень, проекти пов’язуються як між собою так і з цілями закладу вищої освіти, а також підвищується прозорість сформованих портфелів наукових проектів. На етапі балансування наукових проектів відбувається розподіл ресурсів відповідно до напрямів наукових проектів і цілей портфеля проектів закладу вищої освіти. При цьому в портфелі повинна збільшитися частка наукових проектів з високою цінністю для закладу вищої освіти і частка проектів, покликаних принести закладу вищої освіти дивіденди від комерціалізації наукових результатів (реалізації патентів) і знизитися частка високовитратних наукових проектів, а також проектів з високими ризиками. В якості основних критеріїв при балансуванні портфеля наукових проектів закладу вищої освіти в роботі використовуються наступні критерії: витрати на реалізацію наукових проектів; цінність проектів для закладу вищої освіти; ризик проектів; частка проектів в портфелі.

Ключові слова: науковий проект; управління проектами; заклад вищої освіти; портфельне управління.

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МЕХАНИЗМ ФОРМИРОВАНИЯ ЭФФЕКТИВНОГО ПОРТФЕЛЯ НАУЧНЫХ ПРОЕКТОВ ЗАВЕДЕНИЯ ВЫСШЕГО ОБРАЗОВАНИЯ

Предметом исследования в статье являются методы, модели и механизмы формирования портфеля научных проектов учреждения высшего образования. **Цель** работы – разработка механизма управления портфелем научных проектов учреждения высшего образования на основе коммерциализации результатов научной деятельности университета на основе системы управления рисками. В статье решаются следующие **задачи**: анализ модели управления научной деятельностью учреждений высшего образования, исследование современных методов управления портфелями проектов научно-исследовательской деятельности университетов, разработка механизма формирования эффективного портфеля научных проектов учреждения высшего образования с учетом рисков и вероятности коммерциализации научных результатов. Используются следующие **методы**: методы управления проектами и портфелями, теория систем и системного анализа, методы управления рисками. Получены следующие **результаты**: разработан механизм формирования портфеля научных проектов с учетом стратегических целей учреждения высшего образования, создан консолидированный план реализации научных проектов портфеля, разработан механизм управления портфелем научных проектов учреждения высшего образования на основе группировки проектов по критериям риска и вероятности коммерциализации научных результатов. **Выводы**: Использование механизма портфельного управления позволит учреждениям высшего образования формировать сбалансированные портфели научных проектов, тем самым более эффективно осуществляя реализацию инновационных программ с учетом критериев риска и вероятности коммерциализации научных результатов. Наиболее сложной задачей системы управления научными проектами является задача формирования портфеля научных проектов. Портфель научных проектов учреждения высшего образования имеет ценность, если позволяет развивать деятельность, направленную на создание и укрепление конкурентных преимуществ. Однако возможности университета в части формирования портфеля научных проектов ограничены доступными ресурсами, а также возрастающей сложностью разработки новейших технологий, требующих привлечения сторонних организаций, ведь возможности учреждения высшего образования для самостоятельного проведения и обработки результатов научной деятельности ограничены. На этапе отбора научных проектов формируется список текущих проектов, проводится анализ научных проектов в портфеле на соответствие стратегическим целям учреждения высшего образования. С помощью группировки научных проектов в портфеле и формирования необходимых критериев соответствия проектов той или иной группе (направлению) научных исследований, проекты связываются как между собой, так и с целями учреждения высшего образования, а также повышается прозрачность сформированных портфелей научных проектов. На этапе балансировки научных проектов происходит распределение ресурсов в соответствии с направлениями научных проектов и целями портфеля проектов учреждения высшего образования. При этом в портфеле должна увеличиться доля научных проектов с высокой ценностью для учреждения высшего образования и доля проектов, призванных принести учреждения высшего образования дивиденды от коммерциализации научных результатов (реализации патентов) и снизиться доля высокозатратных научных проектов, а также проектов с высокими рисками. В качестве основных критериев при балансировке портфеля научных проектов учреждения высшего образования в работе используются следующие критерии: расходы на реализацию научных проектов; ценность проектов для учреждения высшего образования; риск проектов; доля проектов в портфеле.

Ключевые слова: научный проект; управление проектами; заведение высшего образования; портфельное управления.

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