

**Umantsiv Galyna,**

PhD (Economics), associate Professor

Kyiv National University of Trade and Economics

*Kyiv, Ukraine*

ORCID 0000-0002-5410-1363

ResearcherID O-4870-2016

**Martyniv Iryna,**

PhD (Economics)

Kyiv National University of Trade and Economics

*Kyiv, Ukraine*

ORCID 0000-0002-3811-683X

ResearcherID N-1909-2016

## **ORGANIZATIONAL AND INFORMATIONAL MODEL OF ANALYSIS OF COMMERCIALIZATION OF INTELLECTUAL PROPERTY OBJECTS**

*The organizational and informational model of the analysis of commercialization of intellectual property objects was developed and proposed. The system of indicators of commercialization of intellectual property objects is defined. The stepwise sequence of the analysis of commercialization of intellectual property objects is presented.*

**Keywords:** *intellectual property, innovation, commercialization of intellectual property objects, analysis of commercialization of intellectual property objects*

**Уманців Галина, Мартинів Ірина. Організаційно-інформаційна модель аналізу комерціалізації об'єктів інтелектуальної власності**

*Розроблено та запропоновано організаційно-інформаційну модель аналізу комерціалізації об'єктів інтелектуальної власності. Визначено систему показників комерціалізації об'єктів інтелектуальної власності. Наведено поетапну послідовність проведення аналізу комерціалізації об'єктів інтелектуальної власності.*

**Ключові слова:** *інтелектуальна власність, інноваційна діяльність, комерціалізація об'єктів інтелектуальної власності, аналіз комерціалізації об'єктів інтелектуальної власності*

**Formulation of the problem.** The rapid trends in the development of the world economy embody the Fourth Industrial Revolution («Industry 4.0»), whose task is to use information technology in production to preserve and enhance the country's competitive advantage [6]. The results of the introduction of Industry 4.0 through the combination of modern information and communication technologies with industrial

production are cyber-physical systems, big data, artificial intelligence and 3D-printing. The development, creation and implementation of such innovative product groups is due to an effectively established process of commercialization of intellectual property objects, which is an orderly sequence of interrelated actions and operations to create (develop), use and transfer property rights to intellectual property objects for the purpose of obtaining economic benefits and social impact formation.

The activation of the process of commercialization of intellectual property objects is gaining momentum in Ukraine. According to research by the IT Ukraine Association and the Office of Effective Regulation (BRDO), Ukraine's information technology sector is the second largest service export industry, accounting for 20% of total services exports [5].

Since the commercialization of intellectual property is an independent process, the list of objects of its analysis, and, consequently, the groups of absolute and relative indicators of their analysis, is greatly expanded. In contrast to the costs of creating objects in material form, the costs of the enterprise in the process of creating intellectual property objects are characterized by increased risk. It is these particular features of the intellectual property creation process that cause some difficulty in using the evaluation results (i.e., determining the effectiveness and efficiency of the process). Together with the intensification of the process of commercialization of intellectual property objects in Ukraine, domestic companies are faced with the question of developing organizational and information support for the analysis of the efficiency of implementation of the process of commercialization of intellectual property objects, which will allow:

- evaluate the enterprise's ability to commercialize intellectual property objects from all factors;
- choose a commercialization strategy that will maximize incomes and generate maximum profits;
- determine the composition and dynamics of costs that arise from the moment the idea is generated before its use;
- get maximum efficiency with minimal risks;
- to calculate the reliable amounts of profits that the enterprise receives in the process of commercialization of intellectual property objects.

**Analysis of recent researches and publications.** In the modern scientific literature, the most frequently investigated issues are the analysis of innovative activity of the enterprise (O. Babchynska [1], O. Cheresniuk [3]), features of the formation of indicators of one way or form of commercialization of intellectual property objects (O. Klipkova [7], Yu. Kovtunenکو [9], R. Kostsyk [8], D. Tymofieiev [11], S. Filyppova [4]). Given the significant contribution of scientists and taking into account current trends in the development of Industry 4.0, there is a need to develop organizational and information support for the analysis of commercialization of intellectual property as a holistic process.

**Presenting main material.** In the process of analyzing the commercialization of intellectual property objects, as well as any other type of activity of the enterprise, its information support becomes important. Getting timely, accurate, complete, and objective information from management is the key to making effective management decisions. That is why it is necessary to constantly transform economic information into analytical. According to G. Mitrofanov, organizational support for the analysis of the activity of the enterprise is based on the theoretical and methodological foundations of its conduct, which include the purpose, content, tasks, objects, subjects, system of economic indicators, methodical methods of processing of input information and generalization of the analysis results [10]. Clarification of theoretical and methodological aspects of the analysis of the process of commercialization of intellectual property objects has allowed to develop the organizational and informational model of the enterprise in the part of commercialization of intellectual property objects (table 1).

*Table 1*

**Organizational and informational model of analysis of commercialization of intellectual property objects**

<b>1. The purpose, content and tasks of the analysis of commercialization of intellectual property</b>		
<i>1.1. Purpose</i>	<i>1.2. Content</i>	<i>1.3. Tasks</i>
<p>✓ Formation of information support for effective management of the process of commercialization of intellectual property objects</p>	<p>✓ Comprehensive and systematic study of indicators of the process of commercialization of IPO, study and measurement of the influence of factors on the analyzed indicators, identification of unused internal reserves, evaluation of the enterprise as a whole and its individual structural elements in the process of commercialization of IPO, formulation of management decisions and their practical implementation</p>	<p>✓ Choice of strategy of commercialization of IPO, choice of form of commercialization of IPO, choice of method of commercialization of IPO, determination of technical and economic indicators of each IPO for potential commercialization and evaluation of cost and complexity the commercialization of IPO, the impact of use and implementation of innovations on the efficiency of the enterprise's production process, analysis of the structure, quality and other parameters of the innovative products produced, substantiation of the effectiveness of the marketing and marketing of innovative products, analysis of the results of creation, receipt and use of innovations (innovative products) on the efficiency of economic activity of the entity etc., calculating the effectiveness of innovative technology deployment</p>

<b>2. The objects and subjects of commercialization of intellectual property objects</b>	
<i>2.1. Objects</i>	<i>2.2. Subjects</i>
Licensing agreements, franchise agreements, franchises, royalties (in the form of income or expenses), factors affecting the choice of the IPO commercialization strategy, capital, current and future expenses, income and future periods, financial results, tax implications	Company management, financial and economic department, control and audit department, law department, department of innovative development, state, investors, creditors, civil society, competitors
<b>3. The system of economic indicators of analysis of commercialization of IPO</b>	
<i>3.1. Absolute cost metrics</i>	<i>3.2. Relative indicators obtained from analytical procedures with accounting data</i>
✓ The value of IPO in the composition of IA, the magnitude of obligations to use the rights to intellectual property objects granted to the enterprise, indicators of the dynamics of intellectual property objects in the composition of intangible assets, income and expenses / income associated with the process of intellectualization objects property	✓ Specific indicators of the structure of the IPO in the composition of IA, income and expenses associated with the process of commercialization of intellectual property, specific indicators of the dynamics of the IPO in the composition of IA, income and expenses associated with the process of commercialization of IPO, general and specific indicators of the effectiveness of the commercialization of IPO
<b>4. The informational support of analysis of commercialization of IPO</b>	
<i>4.1. External information</i>	<i>4.2. Internal information</i>
Regulatory and reference	Accounting, planned
<b>5. Methods of processing primary (input) information</b>	
<i>5.1. Economic and logical methods</i>	<i>5.2. Economic and mathematical methods</i>
<b>6. Generalization and implementation of the results of the WIP commercialization analysis</b>	
<i>6.1. Generalization of results</i>	<i>6.2. Implementation of results</i>

*Source: developed by the authors*

At each stage of the commercialization of intellectual property objects (initiation, acquisition (creation) of intellectual property objects, marketing of intellectual property objects, use of intellectual property objects) management has different information needs, including the definition of indicators for different objects of commercialization analysis. At the initiation stage, for example, the main object of analysis is the current costs of the enterprise for the investment project, the likely benefits, payback, profitability from it, as well as assessing the impact of factors on the choice of commercialization strategy. At the stage of acquisition (creation) of intellectual property objects, in addition to the expenses of the entrepreneur, which form the initial value of intangible assets, indicators of the structure and dynamics of intangible assets in the assets of the enterprise, indicators of the efficiency of their use, etc. At the stage of marketing of intellectual property objects, the object of analysis is also the costs, but related to the innovative products promotion. At the stage of the use of intellectual property objects, the composition of the objects of commercialization analysis is significantly expanding, in particular indicators of not only the expenses,

but also the profit received by the enterprise from commercialization, as well as its financial result. Given that the analysis of commercialization of intellectual property objects involves the calculation of a large number of indicators, it is proposed to organize them according to the stages of commercialization (table 2).

*Table 2*

**The system of indicators of analysis of commercialization  
of intellectual property objects**

The stage of commercialization	The object of analysis	The absolute figure	The relative indicator
Initiation	current costs of the enterprise on the innovation-investment project, probable benefits, profitability, profitability, assessment of the influence of factors on the choice of commercialization strategy	R&D expenditures, net present value, reported costs, etc.	return on investment, payback period, production optimization indices, etc.
Acquisition (creation) of IPO	capital and recurrent costs associated with the acquisition (creation) of IPO as part of the intangible assets	the amount of capital and operating costs associated with the acquisition (creation) of IPO as a part of the IA, the indicators of IPO dynamics in the composition of intangible assets, income, and expenses / revenues related to the process of commercialization of intellectual property objects	specific indicators of the structure and dynamics of the IPO as part of the intangible assets
Marketing of IPO	costs of marketing IPO, including marketing costs	the amount of marketing and marketing costs	specific indicators of the structure and dynamics of marketing and marketing costs
Use of IPO	capital, recurrent and future expenses related to the commercialization of the IPO, income of the reporting and future periods and the financial result from the commercialization of the IPO, tax consequences; royalties (in the form of income or expenses) and the like	the amount of capital, current and future expenses, income of the reporting and future periods	specific indicators of the structure and dynamics of the income and expenses associated with the process of commercialization of the IPO, indicators of efficiency of use of the intangible assets, indicators of the efficiency of commercialization of the IPO

*Source: developed by the authors.*

The proposed indicators make it possible to analyze and evaluate the process of commercialization of intellectual property as an independent holistic process. Based on the principle of complexity of economic analysis, according to which a comprehensive study of causal interdependencies, a comprehensive assessment of the input parameters of the functional structure, their change and development at the object under study in space and time, quantitative and qualitative features and output (effective) parameters of this process [2], analysis of the commercialization of intellectual property objects should ensure that the financial condition of the firm corresponds to its targets for innovative development; assessing the capacity for innovative development [1]; choice of commercialization strategy; evaluation of intellectual property utilization indicators; assessment the impact of intellectual property transactions on the firm’s financial performance. That is why it is proposed to analyze the commercialization of intellectual property in such a sequence (figure 1).

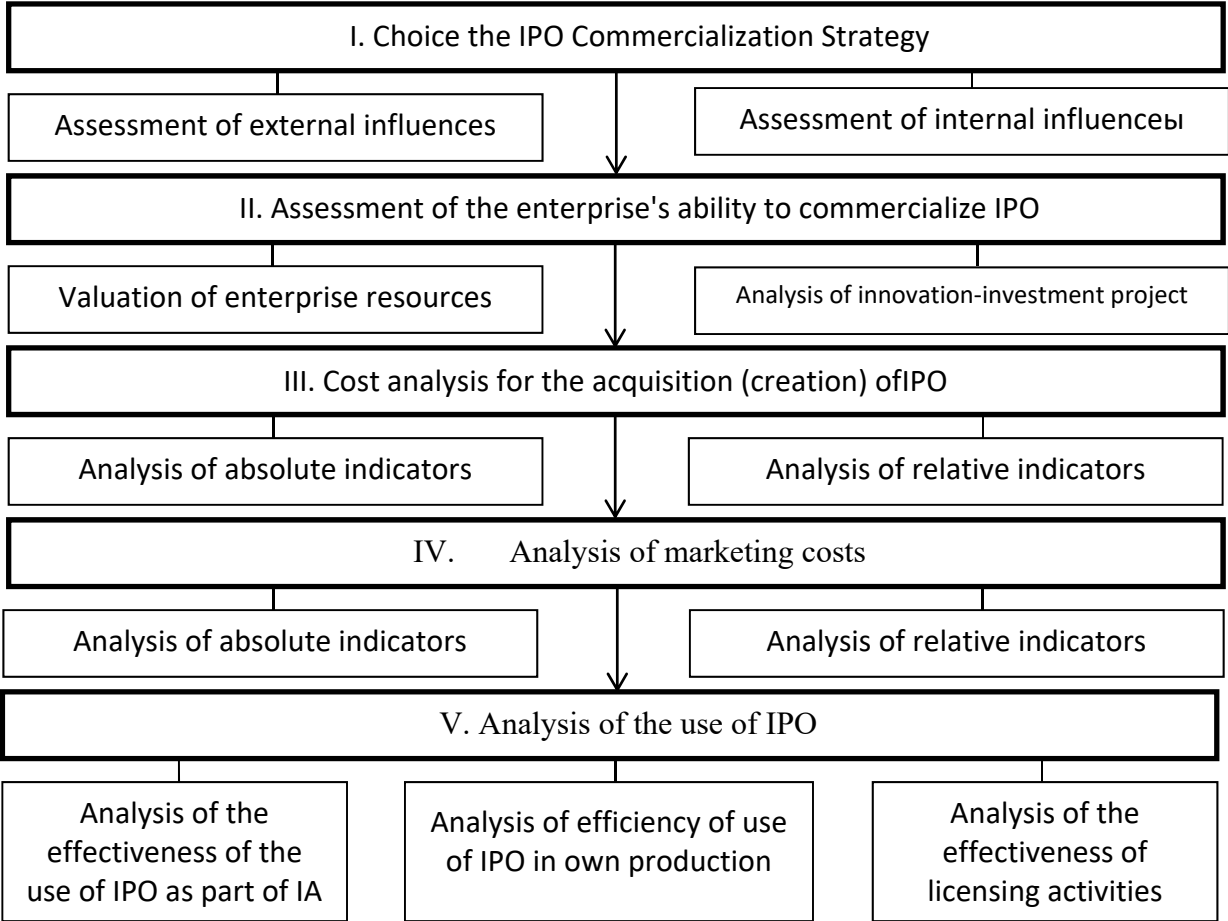


Figure 1. Stages of analysis of **commercialization of intellectual property objects**

Source: developed by the authors.

The proposed stages of the analysis of commercialization of intellectual property objects make it possible to analyze commercialization as a holistic process.

**Conclusion.** Organizational and informational support plays a key role in the analysis of the commercialization of intellectual property.. The need to develop organizational support for the process of commercialization of intellectual property objects in terms of identifying the purpose, content, tasks, objects, entities, system of economic indicators, which is presented in the form of organizational and informational model, as a component of improving the quality of the project management system. This made it possible to form an organizational and information model for the analysis of the commercialization of intellectual property objects, which is the basis for the development of a methodological toolkit for the analysis of indicators of risk diagnostics and assessment of factors influencing the effectiveness of commercialization of intellectual property objects. In order to meet the information needs of users regarding the commercialization of intellectual property, a system of indicators for the commercialization of intellectual property at each of its stages was developed. These proposals led to the development of stages of analysis of commercialization of intellectual property objects as a holistic process.

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