



## ODDÍL 7. METODIKA A ORGANIZACE VÝZKUMU ZÁKLADŮ DUŠEVNÍHO VLASTNICTVÍ

*§7.1 FUNDAMENTALS OF INNOVATIVE RESEARCH  
METHODOLOGY WITH FUNDAMENTALS OF  
INTELLECTUAL PROPERTY (Kliuchevych M. M. Stoliar S.G.)*

**Introduction.** The emergence of the discipline "Methodology and organization of scientific research on the basics of intellectual property" was caused by the rapid development of scientific and technological revolution, rapid renewal of knowledge, increasing the amount of scientific and scientific and technical information. Today, more than ever, there is a need for highly qualified specialists who have good general scientific and professional training, capable of independent scientific and creative work. These specialists must not only be well versed in new methods of research and development, but also be able to implement their results in the production process.

Discipline "Methodology and organization of research with the basics of intellectual property" includes: philosophical aspects, methodological foundations of scientific knowledge, study of the structure and main stages of research. This course examines the methods of theoretical research, modeling issues in research and helps to choose the right direction of research. When studying the course, higher education students must learn to search, collect and process scientific information, as well as to conduct, process and format the results of experimental research.

Methodology is the doctrine of the organization of activities. Any research activity is always aimed at obtaining an objectively new result. Therefore, productive activity requires





organization. If the methodology is considered as a doctrine of the organization of activities, it is necessary to understand what is "organization".

"Organization" means: the internal order and coherence of the interaction of more or less differentiated and autonomous parts of the whole, due to its structure; a set of actions or processes that lead to the formation and improvement of relationships between parts of the whole; associations of people who jointly implement any program or goal and act on the basis of certain procedures and rules [1].

The methodology considers the organization of activity as a purposeful human activity. To organize activities - therefore to organize them into a holistic system with clear and definite characteristics, logical structure, determining the process of its implementation.

Thus, the methodology of scientific research consists of: characteristics of scientific activity (features, principles, conditions, norms of scientific activity), logical structure (subject, object, subject, form, methods, results of scientific activity) and temporary structure of scientific activity phases, stages, stages of scientific activity).

With the transition from a planned to a market economy, in the context of Ukraine's entry into the world community, the role in economic and social development of society increased the results of intellectual (creative) human labor, which include inventions, utility models, brands of goods and services) plants and animal breeds, trade secrets, works of literature and art, databases, computer programs, phonograms and videograms, etc. These and other results of intellectual work are called "objects of intellectual property rights" or "intellectual property".

Intellectual property is part of a broader concept of "intellectual capital". Therefore, in order for the applicant to





form a holistic view of the nature, forms of development and methods of use of intellectual property, it is proposed to study the direction of "Fundamentals of Intellectual Property".

### ***Methodological bases of scientific research.***

In the research work there are scientific directions, problems and topics. The scientific direction is the sphere of research of the scientific collective devoted to the decision of the big fundamental theoretically experimental problems in the field of science. The structural units of the direction are complex problems, topics and issues [2].

The problem is a complex scientific task. It covers a significant area of research and should be of long-term importance.

The problem consists of a number of topics.

A topic is a scientific task that covers a certain area of scientific research. It is based on numerous research questions, which are understood as smaller scientific tasks. When creating a topic or question, a specific task is set in the research: to develop a design, new material, technology, etc. Solving the problem poses a more general task, for example, to solve a set of scientific problems, to make discoveries.

Choosing a problem or topic is a very difficult and responsible task and includes a number of stages: problem formulation; development of the structure of the problem (highlight topics, subtopics and issues); establishing the urgency of the problem, ie. its values for science and technology [3].

After substantiating the problem and establishing its structure, the choice of the research topic begins. The topic has a number of requirements: relevance, novelty, economic efficiency and significance.

Successful conduct of any scientific research largely depends on the timely provision of operational and complete





information on the achievements of science and technology, its effective use in research, design and production enterprises. It is impossible to form a correct idea of the best world and domestic results if the information about it is incomplete and unreliable and received late. Therefore, an extremely important task is the development of a system for collecting, processing, storing, efficient search and transmission of information based on the achievements of modern computer technology [4].

*Methods and features of theoretical research.*

Analytical research methods are used to study physical models that describe functional relationships inside or outside the object. They are used to establish a mathematical relationship between the parameters of the model. These methods allow to conduct an in-depth study of the object and establish quantitative accurate relationships between arguments and functions [2, 5].

Analytical research methods using experiments. Any physical processes can be studied analytically or experimentally. Analytical dependences are a mathematical model of physical processes. Such a model can be represented as an equation or system of equations, functions, etc.

Experimental research methods allow a deeper and more detailed study of the research process. However, the results of the experiment cannot be transferred to another process that is close in physical essence. This is because the results of any experiment reflect the individual characteristics of the process under study. From experience it is not yet possible to determine which factors have a decisive influence on the process, if you change different parameters at the same time [6].

This means that in an experimental study, each specific process must be investigated independently. Experimental methods allow to establish private relationships between variables in strictly defined intervals of their change.





Thus, analytical and experimental methods have their advantages and disadvantages, and this complicates the solution of practical problems. Therefore, the combination of positive aspects of both methods is promising and interesting [2, 7].

Probabilistic-statistical research methods – when using these methods, a mathematical apparatus is used. Probable process is a process of changing over time the characteristics or state of a system under the influence of random factors [3, 8].

Methods of systems analysis – a set of methods and techniques for studying complex objects – systems that are a complex set of interacting elements. The essence of systems analysis is to identify relationships between elements of the system and establish their impact on the behavior of the system as a whole [9].

Theoretical research begins with the development of a working hypothesis and modeling of the object of study and ends with the formation of theory. The theory goes in its development from the quantitative measurement of the parameters of the object and the qualitative explanation of the processes occurring to their formalization in the form of methods, rules or mathematical equations [10].

Theoretical research includes several characteristic stages [11]:

- ♦ analysis of the physical essence of processes and phenomena;
- ♦ formulation of the research hypothesis;
- ♦ construction of a physical model;
- ♦ mathematical research;
- ♦ analysis and generalization of theoretical research;
- ♦ formulation of conclusions.

The process of theoretical research is accompanied by continuous formulation and solution of various problems related to the detection of contradictions in the adopted theoretical models.





Only correctly and reasonably chosen method guarantees the reliability of the results obtained during the research. Therefore, an important stage of research is the development of research methods. The methodology should include theoretical and experimental research.

Experiment is the most important part of scientific research, which is based on scientifically based experience with well-considered and managed conditions. In scientific language and research, the term experiment is usually used in the sense common to a number of combined concepts: purposeful observation, reproduction of the object of knowledge, experience, organization of special conditions of its existence, prediction. This concept is embedded in the scientific formulation of experiments and observations of the studied phenomenon in conditions that are accurately taken into account, to monitor the progress of its development and reproduce it every time these conditions are repeated. In itself, the concept of "experiment" means an action aimed at creating conditions to reproduce a phenomenon and as pure as possible, ie not complicated by other phenomena [3, 8, 9, 12].

The main purpose of the experiment is to identify the properties of the studied objects, test the validity of hypotheses and on this basis a broad and in-depth study of the research topic. The staging and organization of the experiment is determined by its purpose. Experiments conducted in various fields of science are branch and have appropriate names: physical, chemical, biological, social, psychological, etc. [8].

Experiments differ [1, 10]:

- ✓ for the purpose of research (ascertaining, transforming, searching, decisive, controlling);
- ✓ according to the method of forming conditions (natural and artificial);





- ✓ by the structure of the studied objects and phenomena (simple, complex);
- ✓ on the organization of (laboratory, field, field, production, etc.);
- ✓ by the nature of external influences on the object of study (material, energy, information);
- ✓ by the nature of the interaction of the means of experimental research with the object of study (ordinary and model);
- ✓ by type of models studied in the experiment (material and imaginary);
- ✓ by the number of factors that vary (single-factor and multifactor);
- ✓ controlled quantities (passive and active);
- ✓ by the nature of the studied objects or phenomena (technological, sociometric), etc.

Summing up, we note that to conduct an experiment of any type requires:

- ✓ formulate a hypothesis to be tested;
- ✓ create programs of experimental work;
- ✓ determine the methods and techniques of intervention in the object of study;
- ✓ provide conditions for the implementation of the procedure of experimental work;
- ✓ to develop ways and methods of recording the course and results of the experiment;
- ✓ prepare the means of the experiment (models, installations, devices, etc.);
- ✓ provide the experiment with the necessary maintenance staff.

### ***Methods and planning of the experiment.***

Proper development of the experimental methodology is of particular importance. Methodology is a set of mental and







physical operations, arranged in a certain sequence, according to which the goal of the study is achieved. During the development of the methodology of the experiment it is necessary to provide [10]:

- conducting a preliminary targeted observation of the object under study or phenomenon in order to determine its initial data (choice of varying factors, hypotheses);
- creation of optimal conditions in which experimentation is possible (selection of objects for experimental influence, elimination of influence of random factors);
- systematic observation of the development of the studied phenomenon and accurate descriptions of facts;
- determination of measurement limits;
- systematic registration of measurements and estimates of facts in various ways and means;
- creation of cross-influences, recurring situations, changing conditions and their nature;
- creating complicated situations in order to confirm or refute previously obtained data;
- transition from empirical study to logical generalizations, analysis and theoretical processing of the obtained factual material.

Properly designed method of experimental research determines its value. Therefore, the development, selection, definition of the methodology should be carried out especially carefully.

Experimental technique is a system of different methods or techniques for consistent and most effective implementation of the experiment.

Each experimenter must draw up a plan or program for the experiment, which includes [1, 9]:

- setting goals and objectives of the experiment;







- justification of the scope of the experiment, the number of experiments;
- choice of factors that vary;
- determining the sequence of changes in factors;
- the procedure for conducting experiments;
- choosing the step of changing factors, setting intervals between future experimental points;
- description of the experiment;
- substantiation of measuring instruments;
- substantiation of methods of processing and analysis of experimental results.

In addition to the above points, the plan of the experiment includes: the name of the research topic; working hypothesis, experimental methodology, list of necessary materials, devices, installations; list of performers, calendar plan and estimates.

Thus, conducting an experiment is the most important and time-consuming stage, and the sequence of experience is very important. After establishing the scope of the experiment make a list of measuring instruments, materials, list of performers, schedule and cost estimates.

All factors that determine the process change simultaneously according to special rules, and the results of the experiment are presented as a mathematical model that has some static properties.

Thus, there are several stages of experiment planning [1]:

- collection and analysis of collected information;
- selection of input and output variables, areas of experimentation;
- choice of mathematical model by which experimental data will be provided;
- plan of the experiment and the choice of the criterion of optimality;





- data analysis and method determination;
- conducting an experiment;
- verification of static preconditions for the obtained experimental data;
- processing of the obtained results;
- interpretation and recommendations on the use of the obtained results.

In the process of collecting and analyzing the collected and processed information establish and analyze all known data about the studied process or object, what factors and how affect the state of the process or object, their relationship, possible limits of change and more. The main requirements for the selection of input factors is the ability to establish the desired value of this factor and maintain it throughout the experience.

### ***Intellectual property in the scientific sphere.***

Everyone is exposed to intellectual property in one way or another, and every day. More precisely, we are faced with issues of its protection and use [13].

The sphere of intellectual property was formed and progressed in step with the evolution of mankind and continues to gain momentum to this day. Modern society is impossible to imagine without intellectual property, because as it develops and actively post-industrialization, information found in the role of intellectual property becomes one of the most important factors of production - along with land, capital and labor [14, 15].

The concept of "intellectual property" has a legal, political, and socio-economic meaning. Let's focus on the latter.

In economic language, the word "intellectual property" is a figurative expression of "intangible assets" (intangible assets). That is, the part of the capital of the enterprise, which is necessary to generate its income, requires costs for its creation and / or maintenance, but is not expressed in any





material objects - with the possible exception of title documents [14].

Intellectual property should be understood as objects that are the result of the creation of the human mind, human intellect, creative and intellectual activities, which constitute a set (complex) of rights that are useful.

Yes, we can identify the main features of intellectual property [16]:

- ❖ Intangibility, ie intellectual property always has an ideal, not material nature. In other words, we can feel them physically, tactilely.

- ❖ Objective expressiveness, ie intellectual property has an expression in an object, for example, a computer – as an expression of an invention, a book – as an expression of a work of literature.

- ❖ Related to property relations. This feature means that the results of intellectual activity can be in civil turnover, for example, in contracts of sale, collateral, and so on. This is the connection.

- ❖ Novelty, this condition means that the created object must be unique, fundamentally new and previously unknown.

- ❖ Artificiality of creation – the essence of this feature is that the objects of intellectual property can be those that were created by man, that is, objects of natural origin a priori can not be intellectual property.

- ❖ Providing legal protection, the most important feature, international conventions contain an open list of objects.

Intellectual property in the objective sense is a set of norms that regulate relations related to the creation and use of a number of results of intellectual creativity and means of individualization of participants in civil turnover [15].





Intellectual property in the subjective sense is a set of transactions of both personal and property nature, belonging to the authors of creative achievements, patent owners or persons who register individualization, their heirs and other successors [15].

The norms of civil law determine the main forms of realization of intellectual property, as well as establish the legal regime for the results of the creative process and establish the procedure for protecting the rights of authors and owners of these rights.

The following forms of intellectual property realization are distinguished [13, 16]:

✓ Patent – exist for an invention or utility model. The patent owner has the right to dispose of his work at his own discretion, but the use of a patented sample without the permission of the patent owner is not allowed.

✓ Copyright – it does not require an examination of novelty, because it is based on the provision that to create independently, for example, two completely identical texts on the same topic is impossible. The peculiarity of copyright is that by their very nature they do not require any confirmation.

So, summing up, we can say that the institution of intellectual property has evolved over time and continues to evolve today. Realizing the importance of intellectual activity and property, mankind began active work to protect and defend it. Currently, the protection of the results of mental activity is carried out by a special UN agency and each state separately. Which is quite understandable, because intellectual property is something without which the economy and society as a whole cannot develop today.

**Conclusions.** The complexity and level of production is growing every year. and is becoming increasingly multifaceted, voluminous, based on the application of different branches of science. The choice of optimal solutions in such a complex





environment that is constantly changing, is difficult without the use of scientific creativity, basic techniques of scientific research.

A modern specialist must not only have deep professional theoretical and practical knowledge, but also have a minimum of knowledge in the field of scientific research. All this will allow you to independently ask and creatively solve various complex issues of production. Therefore, the introduction of science in production necessitates raising the professional level of specialists.

Modern society needs and depends on intellectual property, so it takes effective measures to protect them. It is for this reason that the study of intellectual property issues is still relevant in science.

Therefore, while studying the discipline "Methodology and organization of research with the basics of intellectual property" higher education students must master the following basic competencies: readiness for self-development, self-realization, use of creative potential; ability to formulate goals and objectives of the study, identify priorities for solving problems, select and create evaluation criteria; ability to abstract thinking, analysis, synthesis.

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