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THE TECHNOLOGY OF THE INTEGRAL SCIENTIFIC ACTIVITIES

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Based on complete-approach of kompletiks formulated the principle of the integrity of the technology research activities and created a general model of the complex technology of research activities, ranging from the formation of technology design and finishing techniques of forming the useful nessand benefits for the creators of technology research activities. The proposed general model is also applicable for a detailed description of each technology research activities, for example., NBIK-complex science and technology.

Keywords: fundamental, principle, integrity, kompletiks, technology, science, work, integrity, triad, the object, the subject, the result, complete-approach, model, NBIK technology.

КОМПЛЕТИЧЕСКАЯ ТЕХНОЛОГИЯ ЦЕЛОСТНОЙ НАУЧНОЙ ДЕЯТЕЛЬНОСТИ

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На основе комплетического подхода (целостного complete-подхода комплетики) сформулирован Принцип целостности технологии научной деятельности и создана общая модель комплекса технологий научной деятельности, начиная от технологий формирования замысла и завершая технологиями формирования полезности и пользы для создателей технологии научной деятельности. Предложенная общая модель применима также и для детального описания каждой из технологий научной деятельности, напр.,

НБИК-комплекса наук и технологий.

Ключевые слова: фундаментальный, Принцип, целостность, комплетика, технология, научная, деятельность, целостность, цельность, триада, объект, субъект, результат, комплетический, подход, модель, НБИК-технологии.

The State Program "Development of science and technology" [1] states that the modern scientific technological development characterized by such major trends as increasing convergence of science, the formation of the convergent technologies on this basis and the growing of the importance of a multidisciplinary approach to research.

Convergence understood as the union, the interpenetration of science and technology, based on NBIK technologies, where N - is the nano-, B - bio, I - information technology, K - Cognitive Technologies [7].

Apparently, the formation of new technologies and sciences by the convergence should be based on a multidisciplinary approach in scientific research and in the creation of technology. The result of the application of this approach should be an integral unity of the aggregate technology, combined sciences, science and technology together. In particular, this should be an integral unity models of technology research and technology for the production of a practical basis of scientific knowledge.

One of the possibilities of multidisciplinary approach is the use of “Kompletika” - philosophy, theory and practice of holistic solutions, the science of the holistic and the whole [12].

Complete-holistic approach is based on a holistic method of kompletika [15] and allows you to create a holistic unity of the study and designed objects and phenomena of the world and human activity.

The purpose of this work is the application of the complete-holistic approach to develop the basic constructions of the integrated technologies of the scientific,

theoretical and experimental researches and technologies for application of their results in the national economy. For the sake of simplicity, we will consider the application of new knowledge to meet the challenges of survival, preservation and development of enterprises. The results obtained in this work could be applied to institutions, organizations, industries, sectors of the economy, with the appropriate adjustments in the national, regional, and global economy.

Technology's evolution. To understand the essence of the proposed models of technology research and production technologies of knowledge, goods and services produced on the basis of scientific knowledge useful to the knowledge of the evolution of the term "technology". For the first time the term "technology" used by Johannes Bekkman in his work "Education and Science" [6]. The discipline which he taught at the University of Göttingen in 1772 for persons engaged in business in the industry was the Technology. The subject of the Beckman's technology was a body of knowledge about the art of both the production of socially useful product and business administration, as well as ways to influence the object of labor. [18]

There are following definitions of the term "Technology":

"Technology – description of the work, techniques, and compilations of all kinds of art, craft and household items, tools and products. From this it is clear that this term is equivalent to the term Encyclopedia…"[8].

"The technology - the science of art, craft and commercial products and instruments of God is divided into mechanical and chemical. The first deals with the processing of raw materials in the form of craft, the second - exposes materials chemical changes. For the first you need to know the mechanics and operation of machinery, and for the second - the chemistry and science "[11].

"The technology is a set of methods of processing, fabrication, modification of a conditions, properties, forms, raw materials or semi-finished products used in the manufacturing of the finished product; the science of how the impact of raw materials or semi-finished products relevant instruments of production. Development of the technology implemented by industry production "[10].

It follows that technology to the early 19th century was considered the teachings of the art implementation of any activity. Then, in the late 19th century to the last third of the 20th century, the concept of technology narrows to the material and energy technology industries.

Today technology "encompasses almost all of what people know and do" in almost every field of activity and "explains a whole, methodically and definitely all kinds of labor with their consequences and causes. "Created technology research - Production of scientific knowledge, technology, goods and services, technology, environmental, political, social, agricultural etc. Technology, as well as in the XVIII century., At the time of its founder, J. Beckman, but the new format of the scientific and practical knowledge, combines almost everything that relates to the production of socially useful product - knowledge, goods, and services.

The definition of the technology of the research activities. First we will give a general idea about the technology, based on the study of technology in terms of the complete-holistic approach [15].

Technology activities will be considered as art prod-effective implementation of such activities, which will lead to obtaining useful results (knowledge, goods, services) with the desired properties, shape, conditions.

Usefulness (utility) of the technology's results will be regarded as the degree of satisfaction of the needs of companies and people, which they receive from consumption of the technology or conduct any activities with the use of the technology.

The usefulness of the result arises from the benefit - a positive, beneficial effect on the activity of the consumer. The utility can be measured and to be a measure of the benefit. We will divide the usefulness and benefits of the result by

- its usefulness and benefit to the consumer of the technology and

- the usefulness and benefits of the technology for the creator of technology.

Theoretical technology activities we call the doctrine of technology as an art productive formation and implementation of the technology. The theoretical basis of

technology as doctrines about art activities is some general model of technology, describes the basic principles of construction and realization of the structure, processes and results and achievements of the usefulness of the technology results for consumers and creators of technology results.

Let us turn to the definition of technology research activities.

We define the technology research activities as an art of a productive scientific activity that is guaranteed to receive a useful new scientific knowledge with the desired properties, shape, conditions.

The results of scientific activities technologies are new scientific knowledge on the subject, the phenomenon of the world and human activity.

The usefulness of the new scientific knowledge - is the degree of satisfaction of the needs of legal or natural persons, which they receive from consumption of the new scientific knowledge or conduct any activities with the use of new scientific knowledge.

The usefulness of scientific knowledge arises from the use of knowledge - a positive, beneficial effect on the activity of the knowledge of the consumer. The usefulness of knowledge can be measured and to be a measure of the use of knowledge. We will divide the usefulness and benefits of knowledge on

- Its usefulness and benefit to the consumer knowledge and
- The usefulness and benefits of knowledge to the creation of knowledge.

Theoretical technology research activities is called the doctrine of the technology research activities, as the art of productive formation and implementation of technology research activities. The basis of the theoretical technology research activities, as the teachings of the art work, based on a certain general model of technology research activities, describing the basic principles of construction and implementation of the structure, processes and outcomes of technology research activities, as well as the usefulness and benefits of achieving results-knowledge for consumers and producers of knowledge .

To form the basis of theoretical research activities using technology complete-holistic approach that allows you to see in complete unity of structure, processes and outcomes of knowledge-technology research activities, as well as the utility and use of knowledge for the consumer knowledge and technology for the creation of scientific activity [12].

Using ***the fundamental Principle of integrity of the Kompletika*** [13], we state the first principle of the integrity of the scientific technology as an integral whole, describing the model of the technology-triad "object-subject-result". To construct the components of the principle of integrity and use of technology principle of the integrity of technology [16] The principle of the integrity of the profession [14] The principle of integrity and innovation. [9]

Application of the complete-holistic approach allows us to formulate principle of the integrity of scientific research and technology to create a general model of the technology for a unified description of all the technologies available and created for a specific research activities, ranging from the design of technologies for shaping and finishing technologies forming the usefulness and benefits for the creators of technology scientific activities.

The Principle of the integrity of the research activities technology. From the standpoint of the Kompletika research activities technology, as a whole, is a complete-triad "object-subject-result" – complete-holistic technology-triad "object-subject-result" of scientific activity.

In complete-holistic technology-triad of research:

- Object of the technology-triad of scientific activity has the direct production of scientific activities,

- The subject of technology-triad of scientific activity is coordinating the production technology of the scientific activity and the state of the scientific activities

- The result of technology-triad of scientific activity is generated in the course of joint activity of the object and the subject of technology-triad of scientific activity in the form of new scientific knowledge.

The principle of the integrity of the technology research activities includes the following statements:

Axiom 1 "General model of the whole for the research activities technology ":

The development and implementation of the complete-holistic technological triad of holistic science activity requires the models of the whole as the technological triads eligible to postulates of whole and integral and to the set of goals of the technologization of the scientific activity.

Axiom 2 "The necessity of object of the technological research activities":

The development and implementation of the complete-holistic technological triad of holistic science activity requires the presence of the object, carrying out the technology of the result production.

Axiom 3 "Common object model of technological research activities":

The development and implementation of the complete-holistic technological triad of holistic science activity demands the compliance between the object of technology-triad and the common to similar objects of a holistic model of complete-object corresponding to the complex problems of technology use scientific activities.

Axiom 4 "The necessity of the subject of technological research activities":

The development and implementation of the complete-holistic technological triad of holistic science activity requires the presence of the subject, which coordinates the technology and the result of the scientific activity.

Axiom 5 "the general model of the subject of technological research activities":

The development and implementation of the complete-holistic technological triad of holistic science activity demands the compliance between the subject of technology-triad and the common to similar subjects of a holistic model of complete-object corresponding to the complex problems of technology use scientific activities.

Axiom 6 "necessity of the process of scientific activity":

The development and implementation of the complete-holistic technological triad of holistic science activity requires the presence of the result of the technological activity in form of the new knowledge.

Axiom 7 "general model of the process of scientific activity":

The development and implementation of the complete-holistic technological triad of holistic science activity demands the compliance between the result of technology-triad and the common to similar results of a holistic model of complete-object corresponding to the complex problems of technology use scientific activities.

These axioms prove the theorem of the integrity of the complete-holistic technology-triad.

Theorem of the integrity "of the general model complete-holistic technology-integrated triad of scientific activity":

The development and implementation of the complete-holistic technological triad of holistic science activity demands the compliance between the technology of scientific activity and the common model of the complete-triad “object-subject-result” of the technologization of scientific activity and corresponding to the complex of problems of the technologization of the scientific activities.

Holistic complete-triad "object-subject-result” of technologization of the scientific activity is not contrary to the generally accepted definitions of scientific research and technology allows you to use them in a holistic unity to solve the problem of forming a triad complete-holistic technology-integrated science.

We now describe the component complete-holistic technology-triad of holistic science of "object-subject is the result of technology use scientific activity", briefly - the triad of technology-research activities.

The result of the of the technology-triad of the research activities. Result-technology triad of scientific activity in the course of its life cycle under the transforming influence of subject and object-technology triad of scientific activities through the following cycles:

1st cycle: design - the first initial view of the technology, the triad, the "loop" of the new knowledge-technology triad of scientific activities,

2nd cycle: the idea (the basic principle of the device) and the construction of new knowledge - a second view of the triad of technology-research activities,

3rd cycle: the project of the new knowledge - is the third of the triad of technology-research activities,

Phase 4: ready to introduce new knowledge, knowledge of, placed on the media - "physical" result may design - the fourth appearance of the triad of technology-research activities,

5th cycle: the project of changes in production, which introduced new knowledge - the fifth appearance of the triad of technology-research activities,

6th cycle: innovative changes in production, in which new knowledge is implemented, the benefits from the introduction of new knowledge for the production, which introduced new knowledge - the sixth form of the triad of technology-research activities,

7th cycle: the benefits of the introduction of new knowledge for the creators of technology-complete-holistic complete the triad of scientific activity - the seventh, the final form of the triad of technology-research activities.

In the first three cycles of new knowledge - the result complete-holistic technology-triad of holistic science activities presented in virtual form - from industrial property, copyright and related rights to the project implementation of new knowledge, technology triad of scientific activity in manufacturing.

In the fourth cycle, new knowledge - the result complete-holistic technology-integrated triad of scientific activity, gets "physical" form, eg., Industrial property, copyright, positioned on certain media, usually the material.

In the fifth cycle, new knowledge - the result complete-holistic technology-integrated triad of scientific activities, becomes part of a new project (perhaps an innovation project) survival, preservation and development of a company; new knowledge can be, eg., The draft of the new management structure of the enterprise (industry, sphere , the national economy, etc.).

In the sixth cycle of new knowledge - the result complete-holistic technology-integrated triad of scientific activity, reflecting the benefit of the acquired company, the benefits and usefulness of this new knowledge in connection with the introduction

of a new project, this advantage may appear, eg., Due to the improved knowledge of the structure of the new enterprise management . Advantage - the benefits of new knowledge can be described quantitatively in the form of a certain kind of utility - economic, environmental, social, and new knowledge. It may be, for example., Additional income received in connection with the application of new knowledge.

In the seventh cycle of new knowledge - the result complete-holistic technology-integrated triad of scientific activity is represented by a certain economic value (and use) of new knowledge for its creator. This benefit may be reflected in the form of a certain measure of economic, environmental, social, complex effect of transfer of the undertaking, to introduce new knowledge, a new project of survival, preservation and development of the use, for example., Improved knowledge of the new management structure of the company.

The main purpose of complete-holistic technology-integrated triad of scientific activity is to transform the initial results complete-holistic technology-integrated triad of scientific activity in the form of a plan (the initial state of the new knowledge) to the final result of the technology-triad of scientific activity in the form of benefits for the creator of new knowledge (the final state of the new knowledge) through the passage of the result of technology-triad of all intermediate states. In this case, all the states of the triad complete-holistic technology-research activities must be integrated set of states of the result.

Because of this transformation cycles between all of the technology, the result of the triad-design of new knowledge (initial state) to the result-benefit of new knowledge (the end state) complete-holistic technology triad provides a holistic science of forward and backward linkages that enable interconnected improve the results of all cycles of scientific activity.

Also under the influence of technology-complete-holistic triad of holistic science of all kinds of technology-triad results of scientific activity in the chain must conversion cycles organically move "from one to another," to be, in fact, an integral wholeness, complete-whole. The unity of all the states of the complete-holistic

technology-integrated triad of scientific activity provides its core code of the whole - the object of intellectual property selected in the first round, and the structure of a holistic approach to the formation and implementation of new knowledge.

Object of the technology-triad of scientific activity. Object complete-holistic technology-triad of holistic science activities, as already noted, carries its own technology for the production of new knowledge, which consists of the following cycles.

1st cycle: the production design of the research activities, i.e. image or "loop" of new knowledge; an analysis of different types of possible scientific results in order to solve the problems in the operational environment is actualized object of research and experiment, media issues and the reasons for their actualization. Then we select the sets of scientific output, suitable as a sound plan to address these problems and to obtain new advantages object of study. Analytical production - the first, the initial view of the object-technology triad of scientific activity, producing analytical project design of new knowledge;

2nd cycle: the production of the ideas of scientific activity (basic principles of new knowledge) and the construction of new knowledge carried out research for evidence-based selection of a certain conception of new knowledge. Made a comparative study of the project contained in the analytical different designs of new knowledge of the suitability for the formation of an idea (the basic principle of the device) and the construction of new knowledge that is suitable for the desired solutions of the problem initially. Research output - second type of object technology-triad of scientific activities, research project produces the basic principle of design and construction of new knowledge;

3rd cycle: the production of the physical implementation of the project of the new knowledge - the result of research activities for the desired solutions of the problem initially on the basis of analytical and research projects. To do this, the new products are designed and engineered the new technology of new products based on new knowledge. Planning and design industry - the third type of object technology-

triad of scientific activity, producing a draft of the new knowledge to the production of a new product, technology, and also to benefit from the production of new products and technologies;

4th cycle: development and experimental application of new knowledge to the production of a new product in the form of physical media, e.g., industrial design, to explore the feasibility of the project of the new knowledge, and identify opportunities to benefit from the production of a new product, technology-based Project application of new knowledge. A pilot production for testing the new knowledge is the fourth kind of object technology-triad of scientific activity.

5th cycle: the production of the project implementation of new knowledge. We engage in the design implementation of the results of scientific activities to address the problems initially selected companies, as well as to assess the benefits and usefulness of the introduction of new knowledge for the enterprise and the creation of new knowledge. Innovation project production - the fifth kind of object-technology triad of scientific activity;

6th cycle: the production of new knowledge in the implementation of enterprise transformation, getting new benefits for the enterprise from the introduction of new knowledge. At the end of the introduction of new knowledge, the company receives the benefit - new (possibly innovative) benefits in the operational environment. Using of these advantages in practice and leads to the utility of the implementation of new knowledge for the enterprise, which is assessed quantitatively. Innovation production - the sixth appearance of the object technology-triad of scientific activity;

7th cycle: production benefits from the introduction of new knowledge in the enterprise for the creators of technology-complete-holistic triad of holistic science activities. This assistance is made to the creator of new knowledge in obtaining benefits from the introduction of new knowledge. To do this, as a rule, the cooperation of organizational and administrative and economic-financial parts of the organization - the creator of new knowledge, with the involved specialized

organizations. Production benefits for the creator of new knowledge - the seventh kind of object-technology triad of scientific activity;

8th cycle: archiving technology-triad of scientific activities; archival production - the eighth appearance of the object technology-triad of scientific activity in the storage of information and the physical form of the triad of technology-research activities described in all seven states, providing information for use in creating new technology- triad of scientific activity.

Production technology to complete-holistic-triad of holistic science of technology is to convert the object-triad in the form of analytical production (initial state of the technology of production of new knowledge) in object-technology triad of holistic science activities in the form of benefits for the creator of the production of new knowledge (the end state) and archival production through the passage of the object-technology triad of all intermediate states. In this case, all the states of the object-technology triad of scientific activities should be integrated set of object states.

To achieve this transformation cycles between all production facilities, technology triad (the analytical production to production and use of archival production) holistic management of the production of scientific activity provides forward and backward linkages that enable interconnected improve facilities of all cycles of integrated science.

Also under the influence of the production management of scientific activity all kinds of object technology complete-holistic-triad of holistic science activities should be in the chain conversion cycles organically jump "from one to another," have, in fact, an integral wholeness, complete-whole. The unity of all the states of the production facility complete-holistic technology-integrated triad of scientific activity provides the core code of the whole production - the relevant intellectual property object selected in the first round, and the structure of a holistic approach to the formation and implementation of new knowledge.

The subject of the technology-triad. Subject complete-holistic technology-triad of scientific activity is coordinating successive transformations:

- Production of the science done complete-holisticobject-technology triad,
- The state of the technology-complete-holistictriad of scientific activities,
- Actually complete-holistic technology-triad of scientific activity.

The process of subject-technology triad of scientific activity is a coordinating process carried out to ensure the integrity and the integrity of the technology and the components of the triad-complete-holistic technology-triad of scientific activities for the effects of environment science.

Coordinating the process of the subject complete-holistic technology-triad includes four general-cycle coordination.

1st cycle: monitoring the outcome of object-technology triad, and the technology itself, the triad of scientific activity in general, carried out research, collection, pre-processing and presentation of aggregate indicators of each type of result and object-technology triad of scientific activity, the technology itself- triad of scientific activities for the subsequent decision-making processes of assessment, authorization (licensing), management of scientific activity. Monitor controller - the first type of entity complete-holistic technology-triad of scientific activity.

2nd cycle: the examination of the state of the result of the object-technology triad, and the technology itself, the triad of scientific activity carried out a special study of the competent, object-technology triad, and the technology itself, the triad of scientific activities as integral and holistic, culminating in submission of a reasoned opinion on compliance result, the object-technology triad of scientific activity and the technology itself, the triad of scientific activities with the requirements of wholeness and integrity. Expert studies conducted at the end of each cycle, the conversion result, the object-technology triad of scientific research and the technology itself, the triad of scientific activity. Judge - the second type of subject-technology triad of scientific activity.

3rd cycle: resolution (licensing) of the state, the object-technology triad of scientific research and the technology itself, the triad of scientific activity, to carry out certain regulatory authorities the standard requirements to the result, the object-technology triad of scientific research and the technology itself, the triad, the use and the operation of which requires permission. Defines the legal basis and authorization forms; decision to grant (or deny) permission on the result, the object-technology triad of scientific activity and the actual technology-triad of scientific activity. Licensing authority, the licensor is the third type of subject-technology triad of scientific activity.

4th cycle: control of the state, object-technology triad of scientific activity and the technology itself, the triad of scientific activity carried out adjustment and redefinition of goals coordination, decision-making, to ensure the integrity and the integrity of the results, the object-technology triad of scientific research and the technology itself -triad of scientific activity on the monitoring results, permits, examination. Manager - the fourth appearance of the subject-technology triad of scientific activity.

Between cycles conversion subject complete-holistic technology-triad of scientific activity, there are forward and backward linkages, allowing better views of the subject of technology-triad of scientific activities of all cycles.

Coordination complete-holistic complete the triad of technology-research activities is the creation of conditions for the implementation of a holistic entity complete-holistic technology-triad together as a focal point - the controller, expert, licensing authority, manager, to ensure the integrity and the integrity of the new knowledge - the result of scientific activity, the object-technology triad of scientific activities and the technology itself, the triad of scientific activity. In this case, all the states of the subject-technology triad of scientific activities should be integrated set of states of the subject.

For this reason, among all the states of the subject of cycles complete-holistic technology-triad of scientific activity - the controller, expert, licensing authority, a

manager, there are forward and backward linkages that allow new knowledge to improve the integrity, the activity of the subject and object-technology triad of scientific activities, as well as the technology itself, the triad of scientific activity.

Application complete-holistic approach (complete-holistic approach) allows you to change the subject of the chain cycles of technology-triad of scientific activities to ensure the transfer of all types of organic entity "from one to another." This allows the subject to be technology-triad, in fact, a single entity subject complete-holistic technology-triad of scientific activity. The unity of all the states of the subject complete-holistic technology-triad of scientific activity provides a solid core-code coordinator of scientific activity - the corresponding object of intellectual property, as well as the structure of a holistic approach to the formation, implementation of innovation.

The complex of the 14 principles of integrity of the technology research based on the proposed by prof. Telemtaev M.M. general principles of holistic implementation of technologies [17]. These principles are presented here in a form adapted for the construction of complex technologies and each technology research - analysts, researchers, planners, economists, production worker, supervisor, expert, licensor, manager, and others.

The principle of the univocal correspondence “goal - the process - structure" of the technology research: each technology research to achieve the goal of getting a holistic scientific result (at all stages from conception to final utility) must implement a holistic process of scientific research purposes is strictly relevant scientific research and implemented with the help of a uniquely defined integrated structure tours organization of scientific research. Operation of technology research described by the set of correspondences, as stipulated in its creation and impact nikshih in the implementation and development. Each triad technology holistic view of scientific research 'goal - the process - the structure "must match the model integrated complete-triad.

The principle of flexibility of the technology research: in accordance with the requirements of the internal and external environments holistic technology research should be able to be reconstructed, ie if necessary, to move from one instance of the "purpose - the process - the structure" of scientific research to another. Flexibility should be carried out cost-effectively (in the sense of a certain set of criteria) for the restructuring of technology research.

Flexibility is one of the manifestations of the universality of the action principle of integrity of scientific research in technology changes in the external environment.

In an integrated technology research these old and the new set of "goal-process-structure" must meet the general model integrated complete-triad.

The principle of the undeteriorative communications of the technology research: communication within each technology, scientific research and communication between all the technologies of the complex technology of scientific research in time (storage) and in space (transport) shall not impair the potential of the technology of scientific research, and the results of its parts, or may impair their at predetermined limits.

This principle reflects the requirements to complete mechanization of transport and storage processes of interactions through time and space in the internal environment of the complex technology of scientific research and technology research with the environment.

In an integrated technology research each interaction should match the model integrated complete-triad.

The principle of technological discipline in technology research: First, there must be a technological rules for each match 'goal - the process - the structure "of scientific research, and secondly, should be used to monitor the observance of technological rules of scientific research and, thirdly, it must A system changes in production schedules of scientific research.

Thus, in accordance with State standards Soviet Union and the Comecon (Council for Mutual Economic Assistance, Eng. Comecon) «technological discipline is respect for an exact match of the process of manufacture or repair of the product requirements of the process and design documentation" [2].

Formulated by our principle of technological discipline extends this concept to technology research.

In an integrated set of technology research "regulation - control regulations - change the rules" should match the model complete-triad.

The principle of enrichment technology research: each piece of technology research should give useful new features (and / or shape and / or state) is convertible to the subject of scientific investigation in terms of achieving the goal of getting an integrated and holistic scientific result, increasing the potential of the technology and the results of scientific research its implementation.

The principle of concentration reflects the need to transform the initial goal of getting the result of scientific research in the elementary goals of the technology research.

In an integrated technology research "production enrichments" of each part of the technology must meet the holistic model of complete-triad.

The principle of monitoring the quality of the technology of scientific research: the establishment of mandatory criteria, monitoring (analysis, evaluation and prediction) qualities of integrity and wholeness of technology research in the sense of these criteria, should be monitored qualities of all matches' goal - the process - structure "and their components in the complex technology research.

Thus, the product quality control in the Soviet Union and Comecon countries governed by the relevant state standards [5] and other regulations have been introduced Quality Mark.

In a seamless and integrated technology research assessing the quality of each structure should correspond to an integrated model of complete-triad.

The principle of manufacturability of scientific research results, of all kinds of possible outcomes of the research needed to achieve the purpose of scientific research, delivered to the external or internal environment must be chosen the most "tech", i.e. providing the most efficient (in terms of the criterion of effectiveness) the potential of this technology research for the production of the necessary scientific results.

Thus, technological GOSTs Soviet Union and the Comecon was treated as one of the characteristics of complex technical device that expresses ease of production. [3]

The requirement for adaptability - a sort of compromise between the possibilities of scientific research and technology needs of the environment. It makes technologization conduct research with the potential queries of the environment, on the one hand, and causes the environment to reckon with the real possibilities of technology research.

In an integrated technology research model of research results must match the model of the integrated complete-triad.

The principle of typing technology research: each of the possible varieties of technology research should be kept to a limited number of standard techniques of scientific research, reasonably different from each other. These varieties are a variety of correspondences "purpose-process-structure" of scientific research, a variety of purposes of scientific research, a variety of structures, the diversity of the processes of scientific research, the diversity of the results of scientific research.

Thus, the main form of standardization processes is their typology, which, in accordance with State standards USSR "eliminates the variety of technological processes reducing them to a limited number of types". [4]

In an integrated technology research for each of these varieties should be the type corresponding to an integrated model of complete-triad.

The principle of stabilization technology research: the need to find and ensure the stability of such modes of all the processes and structures of the states of

all technology research that provide the most efficient (in terms of the criterion of effectiveness) the potential of technology research for the integrity of results of scientific research.

In an integrated technology research every stable state must match the model complete-triad.

The principle of the release of a person in the technology of scientific research: through the implementation of human activity in the technology research machines, robots, machines, organisms, etc. to release the person for the spiritual, moral and intellectual activities for development work of his mental and physical health.

In an integrated technology research release shall not violate the rights of its compliance model complete-triad.

The principle of continuity in the technology of scientific research: the productivity of each technology research must comply with the affordability of all the components of environmental technology research, consumer research capabilities of the technology research must be productive activities of all components of environmental technology research.

Thus, in accordance with the principle of continuity of each technology products of scientific research should be consumed by the environment at the same speed with which they are produced.

In an integrated technology research, each collection of "technology of scientific research - the result of scientific research - the consumer of research results" should match the model complete-triad.

The principle of balance in the technology of scientific research: the total amount of any resource (as well as every known component of any resource) consumed by technology research for some time, should be equal to the total quantity of the resource (component, respectively) entering at the same time, the technology scientific research in its external environment. This condition applies to the technology research and its parts and elements.

In an integrated technology research, each collection of "technology of scientific research - the result of scientific research - the consumer of research results" should match the model complete-triad.

The principle of ecological compatibility technology research: the impact of technological systems research, social, environmental and other systems on each other should lead to sustainable progressive development of each of these systems and technologies, as well as their collections.

In an integrated technology research, each collection of "technology research - society - nature" must match the model complete-triad.

The principle of coordinated development: the development of the technology of scientific research and its components (objectives, components, parts, structures, processes, others) must comply with the evolution of the problems intents and purposes, the external and internal environments of scientific studies, which are necessary to achieve the results of technology research. The development of technology research should be based on an agreed project management of the actual technology research and development projects of its external and internal environments.

In an integrated technology research each set of "technology research - society - environment" must match the model complete-triad.

Conclusions

Application of the complete-holistic approach enables us to formulate principle of the integrity of the scientific technology and to create a common model of the technology for a unified description of all the complex technology available and produced for specific research activities, ranging from the design of technologies for shaping and finishing technologies forming the usefulness and benefits for creators technology research activities.

14 principles for holistic implementation of technology research were formulated.

The proposed general model and principles of holistic technology research activities is also applicable for a detailed description of each technology suite of technologies and scientific activities of each of these technologies.

It is also applicable to the construction complete-holistic NBIK-convergence for complex technologies as an integral association interpenetration NBIK-sciences and technologies in the NBIK-complex of the technologies, as well as for a unified description of each science, technology and NBIK-complex.

They also could be applied for the construction of the complete-holistic complex of sciences, as well as for a unified description of each science as a combination of several fields of study.

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