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ECONOMIC ASPECTS OF APPROPRIATION OF INFORMATION-DIGITAL INTELLECTUAL PRODUCT IN THE CONDITIONS OF MODERN KNOWLEDGE INFORMATION REVOLUTION

In the context of the dissemination of the knowledge information revolution, research on the peculiarities of the transfer of advanced technologies as a manifestation of their appropriation as intellectual property becomes relevant. The goal is to develop a mechanism for managing the transfer of advanced technologies and to identify the functions of their subjects, obstacles, and the content of their reproduction. The integration method is a synthesis of several approaches: a) dialectical-materialistic method is employed to reveal the driving role of contradictions in the evolution of the appropriation of information-digital intellectual products; b) modeling is used for logical generalization and concretization of the interaction among subjects involved in appropriating information-digital intellectual products; c) activity-praxiology approach is employed in analyzing the structure and overall outcomes of the operation of the machine-sized cognitive system as a component of human activity; d) system-synergistic method is utilized to establish objective development tendencies of public production through the formalization of the functioning of the production use of information-digital intellectual products. The transformational characteristics of the appropriation of information-digital intellectual product as one aspect of the transfer of advanced technologies have been identified. The functions of the subjects of appropriation of information-digital intellectual property have been specified according to the following economic roles: “creator-producer”, “producer-mediator”, and “mediator-consumer”. The theoretical concepts of the typology of stages of appropriation of information-digital intellectual product have been refined based on partial and general criteria. The

essence of the disproportions in the reproduction of subjects of the transfer of advanced technologies (creators, producers, mediator-entrepreneurs) has been revealed. Relevant statistical data on the latency and actualization of the appropriation of information-digital intellectual product in a strategic perspective have been identified to reflect the content of barriers to its production use. The constant accumulation of disproportions in the reproduction of subjects of the transfer of advanced technologies is an obstacle to the development of social production. The prospects of eliminating this obstacle in the direction of externalizing the appropriation of information-digital intellectual product in its production use and self-value enhancement have been formalized in a system of equations. As limitations of such a system of equations, a set of functions and alternatives for the production use of information-digital intellectual product according to the economic roles of its subjects are indicated.

Keywords: information-digital intellectual product, ownership and appropriation of intellectual product, mechanism for managing the transfer of new technologies

JEL classification: ***D11, D23, J24, L24, O14, O34***

В умовах поширення знаннєво-інформаційної революції актуалізується дослідження особливостей трансферу новітніх технологій як прояву їх привласнення в якості інтелектуального продукту. Метою є розробка механізму управління трансфером новітніх технологій та виявлення функцій їх суб'єктів, перешкод та змісту їх відтворення. Виявлено трансформаційні особливості привласнення інформаційно-цифрового інтелектуального продукту як одного з аспектів трансферу новітніх технологій. Функції суб'єктів привласнення інформаційно-цифрового інтелектуального продукту конкретизовано за наступними економічними ролями: «творець-продуцент», «продуцент-посередник», «посередник споживач». Теоретичні уявлення про типологію етапів привласнення інформаційно-цифрового інтелектуального продукту удосконалено за критеріями частковими та загальними. Розкрито зміст диспропорцій відтворення суб'єктів трансферу новітніх технологій (творців, продуцентів, посередників-підприємців-новаторів). Виявлено релевантні статистичні дані про латентність та актуалізацію привласнення інформаційно-цифрового інтелектуального продукту в стратегічній перспективі для відображення змісту перешкод його виробничого використання. Постійне накопичення диспропорцій відтворення суб'єктів трансферу новітніх технологій є перешкодою розвитку суспільного виробництва. Формалізовано в системі рівнянь перспективи зняття відміченої перешкоди в напрямку екстерналізації привласнення інформаційно-цифрового інтелектуального продукту при його виробничому використанні та самозростанні вартості. У якості обмежень такої системи рівнянь зазначено множину та альтернативи виробничого використання інформаційно-цифрового інтелектуального продукту за економічними ролями його суб'єктів.

Ключові слова: інтелектуальний продукт, власність та привласнення інтелектуального продукту, механізм управління трансфером новітніх технологій

JEL classification: ***D11, D23, J24, L24, O14, O34***

1. Introduction

Formulation of the problem. The changes occurring in the socio-economic development of countries worldwide under the influence of digital technologies, further amplified by the COVID-19 pandemic are an irrefutable fact. In the context of the expansion of the information revolution, the issue of appropriating information-digital intellectual products through the transfer of full or limited ownership rights to the latest technologies, intellectual resources, or information has become urgent. Government regulation of innovative-investment activities in most countries has faced challenges regarding technology transfer, particularly in the context of professional training of specialists for both public sector and businesses, legitimizing the production of high-tech goods, and enhancing the innovative endeavors of domestic economic entities. These efforts aim to bolster the competitiveness of national economies in the global markets of high-tech commodities, which is increasingly vital in the wake of the modern knowledge information revolution.

This phenomenon is reflected in the national scientific literature where it serves as a cornerstone for establishing cause-and-

effect relationships between the transfer of technologies and the financing of research institutes in Ukraine. The incorporation of these traditions by researchers, along with the exploration of stimuli for creative activity, such as the appropriation of information-digital intellectual products [11], will facilitate the enhancement of the efficiency of state scientific, technical, and educational policies in the realm of digital transformation. This, in turn, will facilitate the integration of innovative technologies into enterprises and the incorporation of international best practices.

The issue of the "innovation-tradition" dichotomy is perceived differently within the scientific community due to the differentiation in the reproduction of subjects related to the appropriation of information-digital intellectual products and its manifestation in technology transfer. Theoretical inquiries into topics such as the connection between the knowledge information revolution and its alignment with local industrial revolutions, as well as the challenges surrounding the appropriation of information-digital intellectual products, are subjects of debate.

Analysis of the latest research and publications. The increasing significance of digital technologies in shaping the new economic system has been substantiated in the global scientific literature through studies of their phenomena (as opposed to noumena – [3; 19; 22]), utilizing criteria such as spheres of activity ("manufacturing production," "material production," "public production" – [21; 14; 8]), stages of societal evolution ("new industrial," "post-industrial," "superindustrial" – [1; 7; 26]), dominance of specific factors ("informational," "communication," "technetronic," "technological innovations" – [13; 2; 6; 17]), civilization distinctions ("civilization of leisure," "civilization of power," "turning civilization," "post-civilization" – [4; 9]), and others of similar nature. Analogous approaches can be employed to assess epochal industrial revolutions or industrial revolutions based on the theory of large cycles of the conjuncture [10]. Hypotheses regarding the justification of local industrial revolutions within the framework of the four industrial revolutions concept [20] have been presented. In addressing these issues, the findings illuminated in works [23; 5; 15] may be considered. These works characterize the general properties of information-digital intellectual products, develop approaches to determining their cost and market price, and propose hypotheses regarding the stimulation of market growth through technology transfer. However, such prognoses typically possess a phenomenological nature, necessitating further detailed research into digital technologies as phenomena of interaction among types of cognitive activity.

Formulating the goals of the article involves developing the mechanism for governing the transfer of the latest technologies and elucidating the functions of their stakeholders, as well as examining the disproportions and content of their reproduction.

2. Theoretical bases of the research

The hypothesis regarding the interaction of the two basic epochs was recognized as a precondition for researching the history of the era of materialization: the epoch characterized by the predominance of natural materialization (agrarian) and the epoch characterized by the predominance of artificial materialization (industrial). Thus, the industrial revolution from the XVIII to the beginning of the XIX century was considered a pivotal moment. Following this, the epoch of natural materialization ceded historical leadership to the epoch of artificial materialization, and agrarian relations gave way to industrial ones. The transitions from the second to the third and from the third to the fourth technical-economic modes were acknowledged as conditions for local industrial revolutions, characterized by significant changes in elements of machines, techniques, technologies, and power sources. Additionally, the dependence of technical-economic processes on materialization and humanization, which serve as the core aspects of the fifth and sixth technical-economic modes, on the available and necessary

essence of human forces, was recognized as an additional assumption [25].

In the current stage of the knowledge information revolution, the potential for machines to produce other machines has been realized, along with the emergence of aspirations towards the development of a machine-sized cognitive system independent from human. This development is envisaged as an alternative and competitor to human-sized cognitive systems. Historically, the machine-sized cognitive systems have evolved based on the human-sized cognitive systems, with the former gradually inheriting the fundamental components ("blocks") of the latter. Over time, there has been a substitution of human content by machine-based elements and verbal-language signs by digital ones.

The basic blocks of a machine-sized cognitive system completely devoid of human elements) were presented, as depicted in Figure 1, including building, structure and attributes of cognitive activity [24]. Each of the mentioned machine blocks performs specific cognitive tasks over corresponding layers of objects, and the formation of specialized cognitive products aligns with established classical imperatives of machine division and cooperation. These blocks and local machines within the machine-sized cognitive system are independent of spatial placement and function as integral components of the singular «machine of machines,» which operates autonomously without requiring human intervention. For example, the block of machines "sensors" performs "sensor-cognitive job" within the sphere of object, resulting in "sensory products". Similarly, the block of machines "intellectual" engages in "intellectual cognitive job" within the spere of object, resulting in "intellectual products" (Fig. 1).

In this context, it is important to focus attention on the transformational specifics of appropriating information-digital intellectual products as a crucial aspect of the knowledge information revolution. Within the framework of the national economy of Ukraine, these specific characteristics were demonstrated, for instance, in the content of stages, conditions,

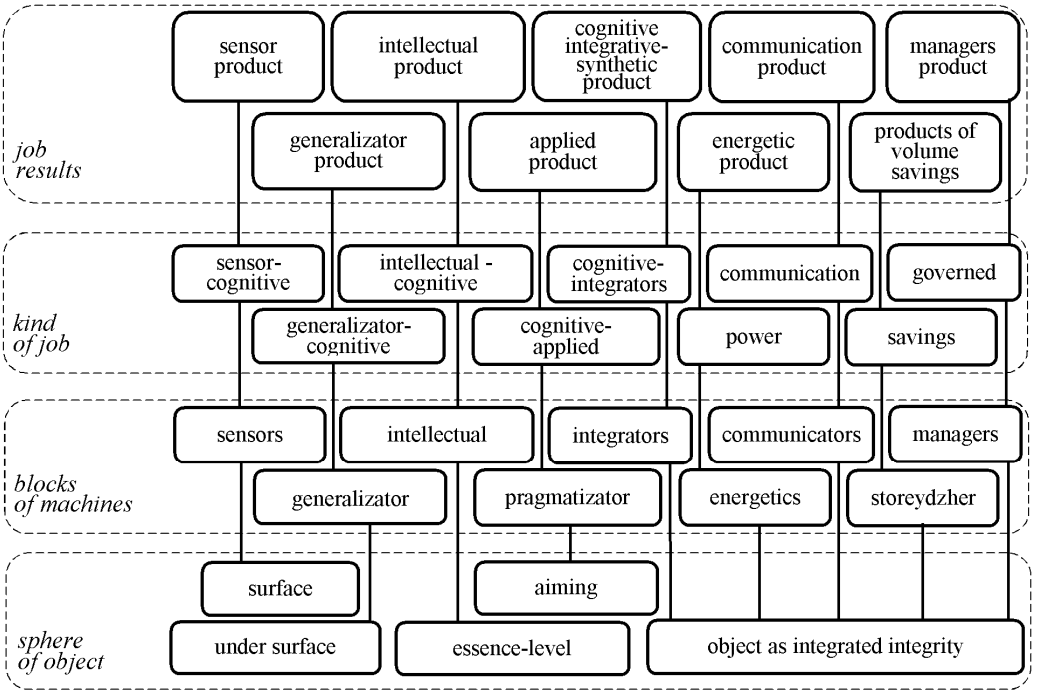

Fig. 1. Building and main results of a machine-sized cognitive system
(*Source: develop by [24]*)

and forms of appropriation At each stage, the chronological sub-stages were delineated as follows: personalization – spontaneous, local, and transformed; socialization – exchange, circulating, and interpenetrating; centralization – nationalization and collectivization; demonopolization – denationalization, privatization, and polymorphism (Fig. 2). The characteristics of the content of the proposed and other stages of appropriating information-digital intellectual products differ relative to socio-economic conditions, resulting in distinct transitions from one subject's ownership to the acquisition by other subjects [11].

In the research of the transformation specifics of appropriating information-digital intellectual products, the functions of the subjects are specified according to their economic roles, ranging from immediate production to final consumption. These roles include the "creator-producer," "producer-mediator," and "mediator-entrepreneur." A creator appropriates the information-digital intellectual product in the form of an authorial copy and then actualizes it by concluding a contract for the legalization of the authorial copy of the intellectual product with the producer. The producer appropriates the legitimate form of the information-digital intellectual product and actualizes it by concluding contracts for the realization of the legitimate form of the intellectual product with the mediator. The mediator appropriates income from the contract of "buying-selling" the legitimate form of the information-digital intellectual product and actualizes it by concluding contracts for embodying the innovation in production or in the lives of entrepreneurs (as consumers). The assignment of these economic roles to subjects involved in the appropriation of information-digital intellectual products is not constant and changes according to the conditions of the knowledge information revolution.

The solution to the tasks of the knowledge information revolution in the national economy of Ukraine involved the actualization of elucidating the specifics of appropriating information-digital intellectual products.

One specific aspect of appropriating information-digital intellectual products in the national economy of Ukraine is the prevalence of appropriating non-self-created information-digital intellectual products over self-created ones. The evolutionary characteristics of this aspect were revealed through the personalization of a portion of the materialized intellectual essence of forces in commodities, the specialization of intellectual activity, its commercialization, and other factors. An inversion of this aspect,

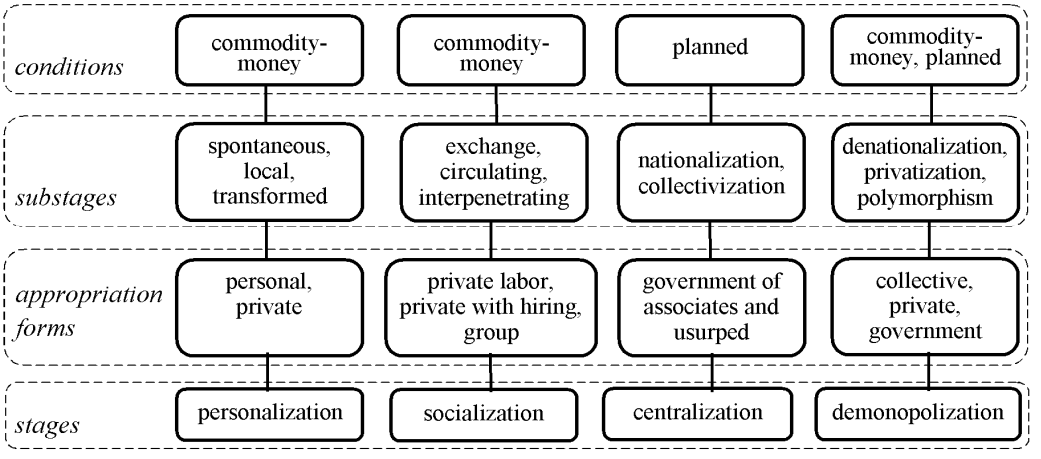

Fig. 2. Comparison of the stages of evolution of the appropriation of information-digital intellectual products in the national economy of Ukraine
(*developed by the authors*)

characterized by total government ownership of the results of intellectual activity, including their legitimate forms (patents, licenses, production secrets) which are not in commodity forms, was also discovered.

Another specific aspect of appropriating information-digital intellectual products in the national economy of Ukraine involves processes of privatization with insufficient justification of the market value of the intellectual product, leading to the loss of adequate income for the government. The transformational characteristics of this aspect were revealed through the privatization of government enterprises without the allocation of the information-digital intellectual product embodied in production technologies. Additionally, the hidden or obvious individualization of creators from the means of production (mainly in the form of non-material assets) and the concentration of the information-digital intellectual product around owners who could not sell it in terms of production technologies were observed.

An additional specific aspect of appropriating information-digital intellectual products within the spectrum of self-increasing the value of various forms of intellectual products, such as "mediately humanized – directly humanized," "materialized – humanized," and "materialized – madiatelly humanized," involves protecting the legal conditions for transforming surplus value into capital. The capitalization characteristics of this aspect were elucidated, including the possibility of integrating the means of production of information-digital intellectual products into more efficient alternative chains for creating surplus value. Furthermore, potential investors' expectations regarding the variable level of productivity of a portion of surplus value, which is transformed into means of production of information-digital intellectual products, were identified.

The appropriation of information-digital intellectual products is carried out by the public within the sphere of intellectual activity, where allocation into the following socio-economic clusters is proposed: creators, producers, mediators, and entrepreneur-innovators. The information-digital intellectual product produced in this sphere becomes fully public only through adequate personal consumption by entrepreneur-innovators. Personal consumption of such products (in their entirety or as constituents) is aimed at enhancing the essence of human forces of the consumer, while productive consumption is directed towards the production of information-digital and/or non-informational products. In personal consumption, information-digital intellectual products prevail as finished products, while in productive consumption, they are primarily intermediate goods. Hence, any consumption of the mentioned product creates the need for its production in a renewed or improved manner. Interaction between productive and consumer activities is not possible without the mediated role of their distributive and exchange forms, beyond their respective interactions. On the other hand, optimal distribution of instruments and workers among the various subspecies and operations of productive activity promotes an increase in the volume of the corresponding information-digital intellectual product and standardization of its quality, legitimized by producers. However, the decision regarding the distribution of such products among consumers is influenced by the dominant socio-economic system within a society. At its core lies the system of relations for appropriating key means of production and incomes. As long as exchange is incorporated into production as one of its components, intermediary exchanges of information-digital intellectual products (both intermediates and final products) are prerequisites for their production, consumption, and the productive consumption of the essence of human forces of the consumer. In this regard, the delivery of information-digital intellectual products to final consumers (entrepreneur-innovators) is relatively independent and indifferent in relation to productive consumption but constitutes an important aspect of consumer production.

Research into the complexity and diversity of socio-economic clusters within intellectual activity, such as the

collaborative nature of creators, producers, mediators, and entrepreneur-innovators, the possibility of simultaneously transferring information- digital intellectual products to multiple consumers, and the direct and reverse interactions among actors and facilities of intellectual activity, facilitates the understanding of the existence of a complex network of information and communication as an integral component of the broader information network.

The driving force behind the reproduction of the cluster of creators (**Cr**) is recognized as the disparity between the appropriation of specialized information-digital intellectual products ($\mathbf{AS_{Hd}}$) and the appropriation of universal information-digital intellectual products ($\mathbf{AU_{Hd}}$). In the context of commodity-money relations, overcoming this disparity by increasing the qualification level of creators («narrow specialization – universality») facilitates the extended reproduction of the cluster of creators. This is formalized as follows (authorial interpretation):

$$Cr = f(AS_{Hd}, AU_{Hd}), \quad (1)$$

In equation (1), the conditions under capitalism are represented, where creators are subject to expropriation of the conditions and results of their activity. This is exemplified by the statement, «capital appropriates not its own science, as it appropriates not its own labor» [14, p. 61]. Additionally, advancements in the qualifications of such individuals are viewed as investments in human capital [16] and other factors.

An important precondition for the extended reproduction of the cluster of producers **(Pc)** is overcoming the disproportion between the appropriation of patented information- digital intellectual products ($\mathbf{AL_{Hnd}}$) and the appropriation of unpatented information-digital intellectual products ($\mathbf{ANL_{Hnd}}$). In the context of commodity-money relations, overcoming this disparity is demonstrated by the increase in the quantity of scientific and technical services related to patenting, licensing, and scientific and technical consulting. These factors contribute to the sustainable reproduction of the cluster of producers. This is formalized as follows (authorial interpretation):

$$Pc = f(AL_{Hnd}, ANL_{Hnd}), \quad (2)$$

In the context of commodity-money relations, the owners of information-digital intellectual products with a higher organic capital structure often attempt to conceal the latest technological discoveries and achievements to hinder, albeit uneconomically, the scientific and technical development of owners of intellectual products with lower organic capital structures. This phenomenon is represented in equation (2).

In the context of commodity-money relations, a driver of the reproduction of clusters of mediators-entrepreneur-innovators **(IN)** lies in the disparities between the appropriation of materialized information-digital intellectual products $\mathbf{AP_M}$ (such as the results of scientific research and developments, communication systems) and the appropriation of humanized information-digital intellectual products $\mathbf{AP_{Hd}}$ (such as the qualifying level, skills, abilities, and knowledge). Overcoming this marked disproportion is associated with the need to embody scientific-technical developments in production, which stimulates an increase in the qualifying level of innovators and contributes to the extended reproduction of clusters of mediators-entrepreneur-innovators. This is formalized as follows (authorial interpretation):

$$IN = f(AP_M, AP_{Hd}), \quad (3)$$

The impact of laws governing the capitalist appropriation of information-digital intellectual products, leading to the expropriation of the intellectual product and its subjective and objective carriers, is encapsulated in equation (3). For instance, a notable effect is the attempt to direct the production use of such products in the form of innovations towards maximizing income and dissociating the reproduction of practical knowledge from fundamental knowledge. This also stimulates consumer society by

transitioning from the «economics of scale» to the «economics of variety.»

In the era of the knowledge information revolution, fluctuations in the sales volumes of information-digital intellectual products are regarded as indicators of the development of means of production and objects of personal consumption. Furthermore, resolving imbalances within clusters of intellectual activity is seen as an inherent objective in advancing public production. The development of social production provides for the expanded reproduction of clusters of subjects of intellectual activity in the direction of increasing: the appropriation of information-digital intellectual products «specialized-universal» (cluster of creators), the production of legitimized information-digital intellectual products (cluster of producers), and the production of humanized information-digital intellectual products reflecting the qualifying level of innovators (cluster of mediators-entrepreneur-innovators). The functionality of such a trend (**Fdp**) can be formalized in the reproduction of clusters of actors in intellectual activity – creators (**Cr**), producers (**Pc**), and mediators-entrepreneur-innovators (**IN**), – by the following system (author's interpretation):

$$\mathbf{Fdp} = \begin{cases} Cr = f(AP_{Hd}, AP_{Hnd}), \\ Pc = f(AP_{M}, AP_{Hnd}), \\ IN = f(AP_{M}, AP_{Hd}), \end{cases} \quad (4)$$

3. Methods of the research

In order to investigate the specifics of appropriating information-digital intellectual products, the relevance of a range of traditional scientific methods was assessed based on criteria such as the sphere of use (general scientific, specific), methodological base (empiricism, pragmatism, deductive, conventionalism), domination in theoretical concepts (methods of descriptive, causal, functional), and science ontology (methods of formal logic, dialectics, dialectics-materialistic, synergetic) [12]. The correlation of the proposed groups of methods with the historical conditions of research was determined. It was revealed that each component of the proposed groups appeared as a method with insufficient accordance to the nature of the researched subject. A search for a method of researching the appropriation of information-digital intellectual products, which is adequate for the modern conditions of the knowledge information revolution, was undertaken.

The methodological basis for researching the specifics of appropriating information-digital intellectual products in the context of the modern knowledge information revolution, particularly in terms of substantiating the integration method of research (Fig.3), has been refined through a critical examination of the proposed groups of methods. This methodology involves synthesis: the dialectic-materialistic method for revealing the dynamic role of contradictions in the evolution of appropriating information-digital intellectual products; modeling for logical generalization and specification of the interaction among subjects appropriating information-digital intellectual products; an activity-praxiological approach for analyzing the structural connections and key outcomes of the machine-sized cognitive system as a component of human activity; and a systemic-synergistic method for substantiating the objective development trend of social production through formalization of the functional utilization of information-digital intellectual products.

The application of the integration method opens up prospects for researching the processes of development and functioning of relations regarding the appropriation of information-digital intellectual products within the context of changes at the mega-, meso-, macro-, and nano-levels of the economic system of society. Additionally, it enables the determination of the content of aspects related to the appropriation of information-digital intellectual products, including their foundations, specifics, and forms. This approach facilitates the formulation of practical recommendations concerning factors and directions for the development of the national economy of Ukraine in the conditions of interaction between the knowledge information and the latest industrial revolution.

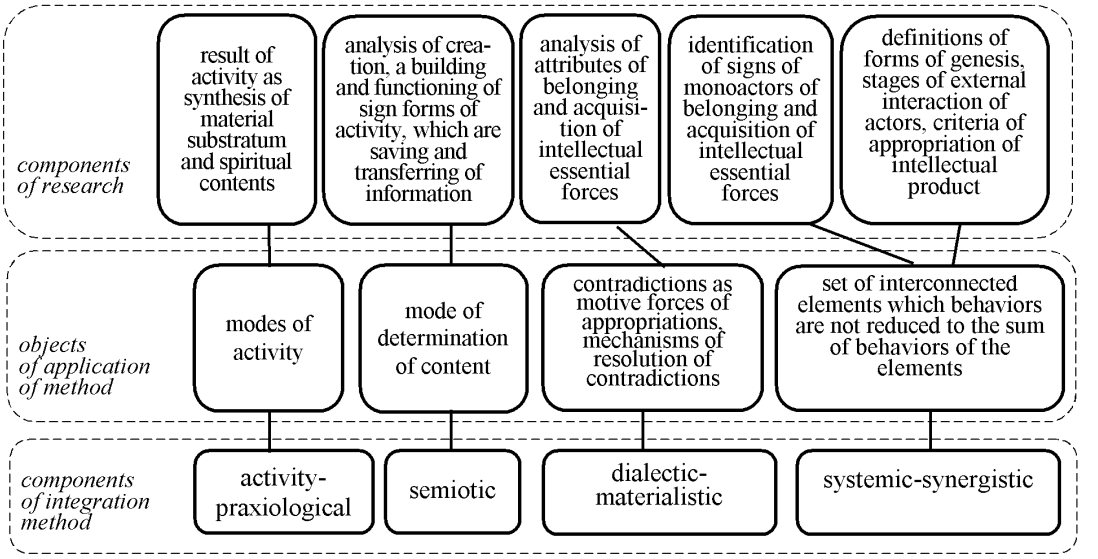

Fig. 3. Integration method for studying the appropriation of an information-digital intellectual product
(*developed by the authors*)

4 Results of the research

The marked tendency in the countries of the European Union (EU-27) is reflected in tradition formalized through the statistical index of the portion of expenses on scientific research and development in GDP (Fig. 4). A comparison of the positive changes in the statistical indicator of charges on scientific research and development in GDP (R&D) among the countries of the EU-27 and its negative dynamics in Ukraine confirms only the intensification of disproportions in the reproduction of clusters of actors in intellectual activity.

The analysis of statistical data regarding the latency and actualization of the appropriation of information-digital intellectual products in a strategic perspective was intended to delineate the content of the marked blocks, namely: the persistent accumulation of disproportions in the reproduction of clusters of actors in intellectual activity, serving as a barrier to the development of public production.

5. Discussion

From the author's perspective, the prospects for eliminating the identified barrier in the context of the knowledge information revolution involve the externalization of the appropriation of information-digital intellectual products in their production and the transformation of surplus value into capital. If, during commercialization, this externalization was regulated by the equivalence (~) between self-creation of information-digital intellectual product of materialized and humanized, then the mechanism of self-increase in value of information-digital intellectual product is actualized during its production use.

In the context of commodity conditions, the self-increase in value of information-digital intellectual products is traditionally researched primarily from the perspective of reproduction scales – namely, simple, extended, and narrowed. For instance, this involves examining the advancement scales of income derived from the productive utilization of information-digital intellectual products. This can be observed in various forms, such as the honorarium for self-increasing the value of the «authorial copy» within the social cluster of creators, the contractual rewards for legalizing the «authorial copy» to enhance the value of the «legitimated form of intellectual property» within the social cluster of producers, and royalties and lump-

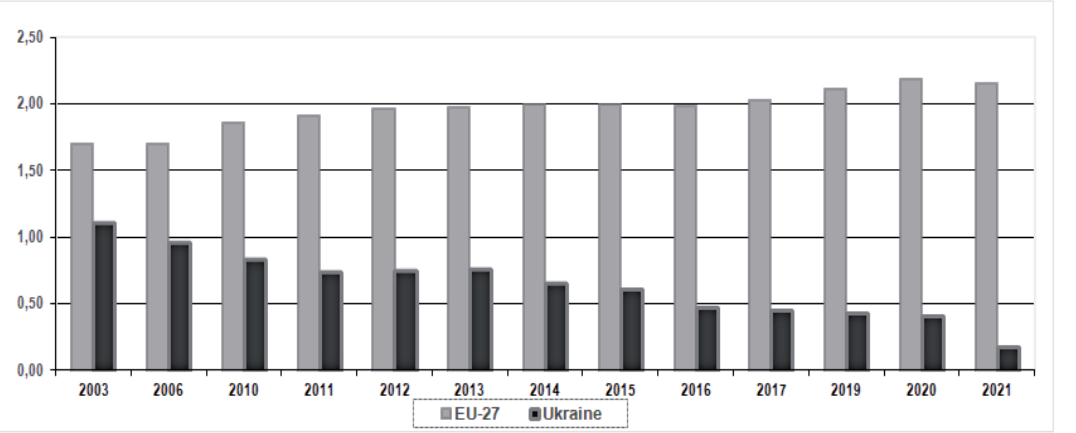

Fig. 4 Research and development expenditure (% of GDP)
(*Source: drawn up based on [17;18]*)

sum payments for enhancing the value of «contracts embodying scientific and technical developments» within the social cluster of mediators, entrepreneurs, and innovators. This emphasis is placed on the productive utilization of information-digital intellectual products within the links of the acquisition chain, termed as «directly-mediate.»

During the research into the appropriation of information-digital intellectual products during their productive use, a corresponding set of economic roles of its subjects in the aspect of self-increasing value was identified (UMidip). These roles include the «neos-constructivist (IDIPnc) or (||) neos-integration of intellectual product (IDIPni) – disemanation of neos intellectual product (IDIPnd)» (pertaining to economic roles of subjects «creator-producer» / TL/); «disemanation of neos intellectual product – legitimated intellectual product (IDIPl)» (pertaining to economic roles of subjects «producer-mediator» /LR/); and «legitimated intellectual product – latent (IDIPtl) or actualized intellectual product (IDIPta)» (pertaining to the economic roles of subjects «mediator-consumer» /RC/). The functionality of such a set in the production use of information-digital intellectual products can be presented as the following system (authorial interpretation):

$$UMidip = \begin{cases} TL = f(IDIPnc \,||\, IDIPni \rightarrow IDIPnd), \\ LR = f(IDIPnd \rightarrow IDIPl), \\ RC = f(IDIPl \rightarrow IDIPtl \,||\, IDIPta), \end{cases} \quad (5)$$

The alternatives for the production use of information-digital intellectual products are distinguished by the economic roles of subjects as «creator-producers.» For creators, the «authorial copy» (TAr) may remain latent under the status of «secrets of production» (LLsp), meaning it is not acquired by the producer and not legalized in the «legal form» (narrowed reproduction as «authorial copy (manuscript) – latent form (secrets of production)»). Alternatively, the «authorial copy» belonging to the creator may be acquired by the producer and obtain a single «legal form» (simple reproduction), for instance, «authorial copy (manuscript) – legal form (patent) /of LAp/.» In another scenario, the «authorial copy» acquired by the producer may obtain alternative «legal forms» (extended reproduction), such as «authorial copy (manuscript) – alternative legal forms (license /of LAli/ and (&) secrets of production /of LAsp/)»).

The following alternatives for the production use of information-digital intellectual products emerge within the spectrum of economic roles of subjects as «producer-mediator»:

- when the producer possesses the «legal forms» (LApr), it may be acquired by the mediator in response to presented demand in either the financial (investment) or real sector (narrowed reproduction). For example, «legal forms (license) – latent contract of sale of legal form (licenses) in conditions of absent demand» /of RLKli/;

- alternatively, if the producer's «legal forms» are acquired by the mediator in the form of a «contract of sale,» it constitutes simple reproduction, such as «legal form (license) – contract of sale of legal form (licenses)» /of RAKli/;

- ascenario arises when the producer's «legal forms» and their alternative legitimate forms (sub-licenses emission) are acquired by the mediator through a «contract of sale» (extended reproduction). For instance, «legal form (license, sub-licenses) – contracts of sale of the legal forms (licenses /of RAKli/ and sub-licenses /of RAKsli/)»).

Furthermore, the alternatives for the production use of information-digital intellectual products are delineated according to the economic roles of subjects as «mediator-consumer»:

- if the mediator possesses the «legal forms» of the intellectual product, they may be acquired by the consumer in a scenario where utility decreases from their use (narrowed reproduction). For instance, «contract of sale of legal form (license /of CKli/) – loss of contact of the use of legal form (licenses /of CLKli/)»;

- alternatively, when the mediator's «legal forms» of the intellectual product are acquired by the consumer on a «disposable» basis upon purchase and «parts» by a lease, it constitutes simple reproduction. For example, «contract of sale of legal form (license) – extension of contract of the use of legal form (license /of CAKli/)»;

- another scenario arises when the mediator's «legal forms» of the intellectual product are acquired by the consumer with an increasing trend in utility from expanding and perfecting their use (extended reproduction). For instance, «contract of sale of legal form (license) – addition of contract of the use of legal form (additional licenses on the technology with greater productivity / of CNKli/)»).

At the conclusion of the discussion regarding the externalization of the

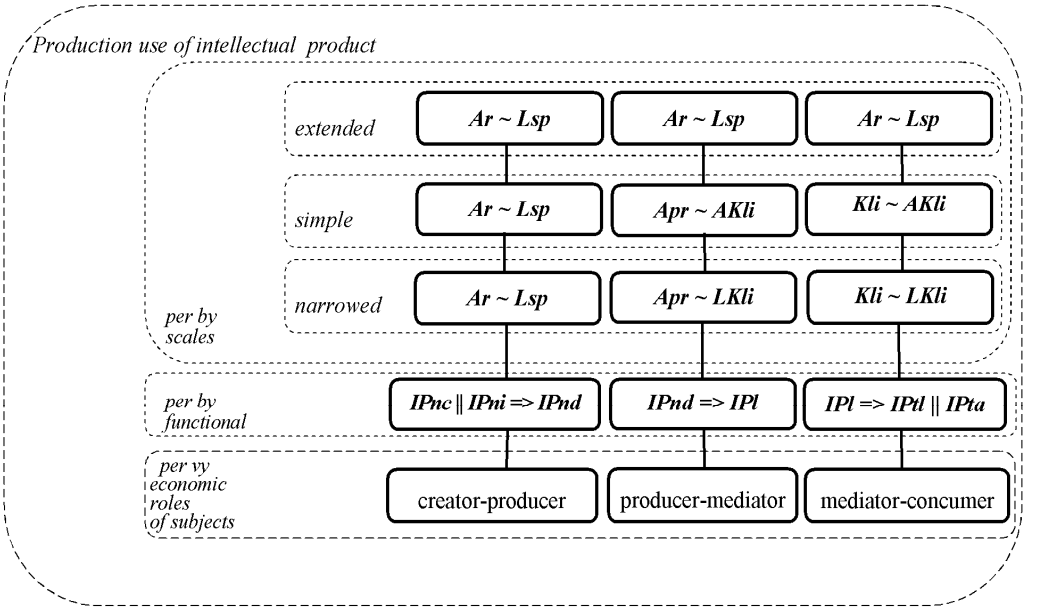

Fig. 5. Characteristics of externalization of appropriation of intellectual product in the national economy of Ukraine
(*developed by the authors*)

appropriation of intellectual property from the perspective of alternative productive uses in the national economy of Ukraine, we delineate its distinctions on Fig. 5 in terms of system limitations (5) and corresponding governance factors.

6. Conclusions and prospects of further researches

The conducted research has revealed that in the modern era of knowledge and information revolution, there is a dominance of information-digital processes in information-related activities and the sphere of information-computer technologies. This leads to the conclusion that there is likely a significant expansion of information-digital processes into economics and other spheres of human life.

At the same time, the transformational specifics of the appropriation of information-digital intellectual products in the national economy of Ukraine were characterized by: a) the dominance of appropriation of not self-created digital information-digital intellectual products over self-created ones; b) the groundlessness of market estimation of appropriated information-digital intellectual products during the process of privatization, resulting in the loss of corresponding incomes for the government; c) the asocial mechanism of converting information-digital intellectual products from government ownership to private ownership; d) the legitimization of conditions for the production use of intellectual products.

Theoretical concepts regarding the typology of the stages of appropriation of information-digital intellectual products are refined according to criteria such as partial (personalization, socialization, centralization, demonopolization) and general (forms of ownership and appropriation of information-digital intellectual products, chronological sub-stages, conditions).

Disproportions in the reproduction of clusters of actors in intellectual activity were identified in the following areas: a) among creators, there exists a disparity between specialized and universal qualification levels; b) producers face imbalances between their capabilities and the distribution of scientific-technical services; c) mediators-entrepreneurs experience disparities between the scales of scientific and technical developments and their embodiment.

The functional development of public production (within the framework of the knowledge information revolution) was formalized through a system of equalization to address the disproportions in the reproduction of clusters of actors in intellectual activity: creators, producers, mediators-entrepreneurs-innovators.

Based on the comparison of positive changes in statistical indicators regarding the portion of charges allocated to scientific research and development in GDP (R&D) among the countries of the EU-27 and the negative dynamics observed in Ukraine, only the intensification of disproportions in the reproduction of clusters of actors in intellectual activity (subjects of appropriation of information-digital intellectual products) was confirmed, but not their content. The use of statistical data on the latency and actualization of the appropriation of information-digital intellectual products in a strategic perspective was intended to represent the content of the marked blocks, namely, the constant accumulation of disproportions in the reproduction of clusters of actors in intellectual activity as a block in the development of public production.

The prospects of eliminating the identified block in the conditions of the knowledge information revolution, focusing on the externalization of the appropriation of information-digital intellectual products in their production use and self-value enhancement, were formalized within the system of equalizations. As an illustration of the limitations of such a system of equalizations, the array of functions and alternatives for the production use of information-digital intellectual products according to the economic roles of its subjects is noted.

Further research will need to focus on refining methodologies for accurately determining market prices for information-digital intellectual products using modern informatively-computer technologies and developing specialized economic-mathematical models for such estimation. However, this will be the focus of future research.

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ECONOMIC ASPECTS OF APPROPRIATION OF INFORMATION-DIGITAL INTELLECTUAL PRODUCT IN THE CONDITIONS OF MODERN KNOWLEDGE INFORMATION REVOLUTION

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In the context of the dissemination of the knowledge information revolution, research on the peculiarities of the transfer of advanced technologies as a manifestation of their appropriation as intellectual property becomes relevant. The goal is to develop a mechanism for managing the transfer of advanced technologies and to identify the functions of their subjects, obstacles, and the content of their reproduction. The integration method is a synthesis of several approaches: a) dialectical-materialistic method is employed to reveal the driving role of contradictions in the evolution of the appropriation of information-digital intellectual products; b) modeling is used for logical generalization and concretization of the interaction among subjects involved in appropriating information-digital intellectual products; c) activity-praxiology approach is employed in analyzing the structure and

overall outcomes of the operation of the machine-sized cognitive system as a component of human activity; d) system-synergistic method is utilized to establish objective development tendencies of public production through the formalization of the functioning of the production use of information-digital intellectual products. The transformational characteristics of the appropriation of information-digital intellectual product as one aspect of the transfer of advanced technologies have been identified. The functions of the subjects of appropriation of information-digital intellectual property have been specified according to the following economic roles: "creator-producer", "producer-mediator", and "mediator-consumer". The theoretical concepts of the typology of stages of appropriation of information-digital intellectual product have been refined based on partial and general criteria. The essence of the disproportions in the reproduction of subjects of the transfer of advanced technologies (creators, producers, mediator-entrepreneurs) has been revealed. Relevant statistical data on the latency and actualization of the appropriation of information-digital intellectual product in a strategic perspective have been identified to reflect the content of barriers to its production use. The constant accumulation of disproportions in the reproduction of subjects of the transfer of advanced technologies is an obstacle to the development of social production. The prospects of eliminating this obstacle in the direction of externalizing the appropriation of information-digital intellectual product in its production use and self-value enhancement have been formalized in a system of equations. As limitations of such a system of equations, a set of functions and alternatives for the production use of information-digital intellectual product according to the economic roles of its subjects are indicated.

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