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NEW ECONOMY: EVOLUTION OF FORMS AND RESEARCH METHODOLOGY

Introduction. *The era of the scientific and technological revolution has qualitatively changed the content and balance of the processes of integration and differentiation of science, contributed to the development of interdisciplinary discourse in the field of scholarly research knowledge, in particular, the identification of the forms and research methodology inherent in the modern stage of the economic research evolution..*

Problem Statement. *Amongst the synthetic integrative tendencies of economic research development, active impulses of scientific heuristics have been noticeably influenced, thus forming perspectives and guidelines for the evolution of cognition forms and methods. One such phenomenon is the formation of the new economy paradigm (from the economy of the information sphere to the digital economy) as a special kind of theoretical and applied research. In recent years, the active processes of conceptualization of the phenomenon of neo-economics and its structural elements have been observed in the scholarly research environment.*

Purpose. *To generalize, to structure, and to systematize the development processes concerning the phenomenon of the traditional economy creativization as an integral factor (stimulator) of special forms (virtualization and typology) and methods (digitization and financialization) in the field of socio-economic relations cognition.*

Materials and Methods. *The methodological framework of this study consists of a retrospective analysis of the context and directions of the information approach application in the process of integration, internal and transdisciplinary synthesis.*

Results. *The new information and economic reality has been comprehended, and the principles of systematic research have been updated, which will contribute to solving the principal issues of the formation and implementation of effective economic, R&D and innovation policies. The creative economy and the development of the economy of the information sphere have been considered beyond the traditional boundaries of the cultural and*

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digital industries. A complex vision of the consequences of their mutual intersection and exchange of solutions and tools in different spheres of social practice, which contributes to the development of a categorical-conceptual apparatus and methodological principles for scholarly research with consideration of social -economic relations in the modern society has been offered.

Conclusions. *In order to stimulate the development of a new economy, it is necessary to identify the factors contributing to the evolution of forms and methods of scholarly research knowledge and the transformation of traditional socio-economic relations into resources of a new formation.*

Keywords: integration of science, scientific heuristics, information approach, economics of information sphere, digital economy, and creative economy.

Many essential features of our dynamic time continue to be determined by the scientific and technical revolution (STR) that was developing in the second half of the 20th century and has not been completed yet. For the first time, this definition was mentioned in 1939 by famous English physicist, historian, and sociologist of science John Bernal in his research *The Social Function of Science* [1]. Its content has already become the subject of special methodological analysis. Since then, the STR theory has been permanently updated and enriched by researchers [2—5]. Today, various aspects of these theoretical generalizations are important for a thorough understanding of the current stage of the development of science and its socio-economic role.

From the methodological point of view, the scholarly research cognitive processes in the STR era are characterized by unconventional, particular relationship of differentiation and integration in science. Throughout the development of science, both these dialectical opposites exist in parallel in various manifestations of scientific knowledge. They are inseparable from each other, like, for example, such controversial aspects as part and whole, singular and general, content and shape, etc. For a long time, scientists were focusing their interest mainly on differentiation, as philosophy (comprehensive "love of wisdom" as a syncretic integrity) was divided into new objects of knowledge, their properties and states, shapes, tools, and instruments theories and branches of science, doctrines, scientific schools and institutes. At the same time, integration as an objective phenomenon (process) was for a long period remained unnoticed (though, as it has been emphasized, it was inevitably inherent in science in most of its manifestations).

It should be noted that from the beginning of the 20th century (that is, even before the formal start of the STR), research activities have been characterized by integrative features. Below, we cite two prominent scholars. According to outstanding German physicist, founder of quantum mechanics, Max Planck, science is a single whole. Its division into separate branches is conditioned by the limited capacity of human knowledge rather than by the nature of things. In fact, there is a continuous chain from physics and chemistry through biology and anthropology to the social sciences, a chain that cannot be broken in any place, unless arbitrarily [6, 183]. In Ivan Franko's opinion, science, like nature, is always integral and inseparable. Everything in it is interconnected, interacting, and interdependent; it is a chain in which all the links are closely interconnected. When we talk about the division into sciences, we do not mean to say that science is really broken up into separate parts that have nothing in common ... Physical and anthropological sciences are, in fact, a single inseparable chain, one whole, because human being is a creature of the nature, with all that it has done and can do is done by innate abilities only [7, 35].

At the same time, the fact that science is a single, integral organism does not eliminate its division into separate, distinct fields of knowledge, primarily, by object and subject of research. This approach to scientific knowledge of reality is well-known and well-founded. However, this division is not absolute since one sphere of knowledge of the world is artificially separated from the other. This is what the cited eminent scholars mean. Therefore, the most significant results should be expected at the intersection of different branches of knowledge in terms of usual classification.

As one can see, scholars started to pay attention towards the problem and methodological support for the further integration of science long before the STR. However, in the second half of the 20th century, its nature qualitatively changed. That time, it became clear that the integration processes in science are as important as the differentiation ones. Moreover, in certain aspects, the integration itself is worth noticing special attention of researchers, because its rates, forms, and mechanisms (and, therefore, possible scientific productivity) have been increasing significantly in the context of STR [8, 9]. Of course, this does not mean it can be studied separately from differentiation or its value can be absolutized.

An important structural and methodological feature of the science development over the last century is gradually changing synthesis of scientific knowledge. According to B.M. Kedrov, Full Member of the Academy of Sciences of USSR, there are three main types: synthesis within one scientific discipline; within several disciplines that are part of the same broad set of sciences (natural sciences, social sciences, engineering, etc.); and synthesis that combines disciplines having clearly different objects and subjects [10]. These types in the scientific methodology are called intra-disciplinary, interdisciplinary, and inter-branch synthesis, respectively.

For the past era science, mainly, intra-disciplinary synthesis, the simplest in nature, was typical. In contrast, the STR science is notable for permanently changing structure of cognitive and synthetic processes, as the share and the importance of interdisciplinary and, in particular, inter-branch syntheses have been growing. And this, of course, is immanently linked to the steadily increasing role of integrative trends in science. Often, the signs of dialectical opposites, differentiation and integration, are combined in one process. Leading researchers have been considering how in the STR conditions, differentiation has got a qualitatively new and unexpected function as it has been intensively involved in the synthesis of knowledge, thereby triggering integration as an opposite trend in science [8, 153—177]. That is why, as B.M. Kedrov explained, the further differentiation of science in modern conditions led to integration instead of separation, unlike it was before [10, 82], new scientific disciplines started to emerge and contribute to bridging previously separated sciences [11, 18].

As V.I. Vernadsky noted, the growth of scientific knowledge of the 20th century quickly blurred the lines between the individual sciences. We are increasingly specializing in problems rather than in science. This allows us to get an insight in the phenomenon under study, on the one hand, and to extend its coverage from all points of view, on the other hand [12, 54]. The 21st century further enhances and deepens this quality of science.

Recently, the deepening of the analysis of science integration has led to the emergence of *transdisciplinary* research, and this concept is more and more frequently met in scholarly research and methodological literature. Sometimes, this term is perceived simply as a synonym for interdisciplinarity, but the semantic difference of these two is clearer. The former origins from the Latin "trans-" that means across, beyond. In the above case, this meaning is logically associated with the emergence of scientists beyond the direct contact of several adjacent disciplines of scientific knowledge. It is about the integration of fields of knowledge that are more or less distant from each other in terms of objects, subjects, and methodological features. Thus, in the integrative processes of this type, the disciplines interact at a certain dis-

tance, through a scientific space between closer (in terms of content or methodology) branches of knowledge.

Transdisciplinarity becomes the most "strong" and typical for the STR era manifestation of the integrative property of scientific knowledge. Transdisciplinary transfer (a kind of jump-like movement) across specific fields of science is typical for such areas as mathematical linguistics, engineering psychology, technical aesthetics, space medicine, social ecology, bioethics, or bionics. Among the newest components of economic knowledge are, of course, environmental economics and economics of the information sphere. These and other such disciplines clearly demonstrate a considerable information effect of transdisciplinarity in research [13].

At the same time, not only intra-, inter-, and transdisciplinary syntheses, but also the synthesis of methodology of scientific cognition and socio-economic relations in a certain formation are getting evident. For example, scientific discoveries give birth to new branches of science, which in turn give impetus to the methodology of cognition and shape the need for new knowledge, innovations, discoveries, metadata, and so on. For centuries, the descriptive and explanatory functions of science seemed sufficient, since they were adequate to the fields of its predominant application in the life of society. According to well-known researchers of the progress of knowledge, the advisory role of science, which paves the way to management, has become significant and especially appreciated only since the mid-20th century [14, 82].

It should be emphasized that the integration of different fields of science and technology, as well as the economy, always creates a noticeable innovation effect in science and practice, because in this case, inevitably there is a qualitatively new fusion of knowledge that determines the emergence of new, unconventional content. In particular, with respect to the modern economy (new economy, neo-economy), it answers the questions in a new way about what are the resources of value creation, the main productive force, the driving factors and mechanisms of value formation, and which new forms of value creation and promotion are considered effective. The economy virtualization has been shaping a new world, a simulation of the reality, where data communication, computer technology, virtual money (cryptocurrency), and globalized, nationally impersonal entities that gain value due to demand in the sphere of public relations have moved to the forefront. In particular, according to one approach, virtual currencies (mainly, decentralized cryptocurrencies) is a service for digitalization of a universal means of value, which is dynamically denominated by a certain community on the basis of a coherent algorithm for generating, distributing, and exchanging information, as a result of which there appears a digital option, i.e. the right to claim a contribution to the operation of the mentioned community. This means, the economy virtualization dramatically modifies the socio-economic relations, economic institutions, values and gradually forms a human being of a different quality, who is immanent to the new virtual world.

Noting the intangibility of neo-economy, well-known economists Dean Baker, Arjun Jayadev, and Joseph Stiglitz call it *weightless economy*, an economy of ideas, knowledge, information, and consider as important as the growing role of emerging markets and a hallmark of this century, as compared with the previous periods. They emphasize that such an economy becomes an essential part of economic production and will be increasingly important for economic growth and development in both advanced economies and emerging markets [15].

A striking example of the determination of neo-economy, in the context of its newest forms, is the whole history of the development of publishing and printing disciplines as a sector of the national economy where natural sciences, engineering, mathematics, and social sciences are constantly interacting with each other and generating social and economic innovations that enrich each specific area of knowledge. This process covers

the fields of materials science, innovative ways of producing printed products and related works, as well as ergonomic, organizational, economic, informational, environmental, and other synthetic factors. At the same time, the central focus of all researchers' efforts is the progress of reproducing and disseminating structured information in all its qualitative diversity as an element of a comprehensive information sphere of the national economy [16].

Another similar example is the development of environmental disciplines in the context of further modernization of the national economy, the formation of a qualitatively new section, social ecology (that, for a long time, was referred to the natural sciences, in particular, biology). Its very name obviously states that this scientific discipline would be absolutely impossible without the leading role of integration in the present-day science: it is the aspect of the environmental theory that is intended to adequately reflect the interaction of the society and the nature [17, 18]. Therefore, it goes about a complete fusion of the two major areas of scientific knowledge, the nature studies and the social science (plus mandatory implementation of fundamentally important components such as mathematical, engineering, medical, philosophical, psychological, etc.).

The fundamental difference between this new area of environmental knowledge and ecology begins with the object of study. For conventional ecology, as founded in the 19th century by Ernst Haeckel, the object is ecosystems that unite certain living organisms (biological species) with the natural environment of their existence and vital activity. For social ecology, the object of study is socio-ecosystems at different levels: local, regional, and global. This concept can be defined as a sustainable set of connections between human society, or its individual, relatively independent parts, and the environment, or as society—nature system, however, in no way, as the society itself and the nature itself. The heart of the cognitive interest of social ecology is socio-natural relationships that are always based on some essential common patterns. The interaction of the society and the nature is governed by other socio-natural and socio-ecological laws to understand which we need a fundamentally new science, the object of which is a higher-order system, i.e. socio-ecosystems [18].

Social ecology quickly took the lead in the science of the STR era. Even more, soon it appeared at the center of a powerful and important process of *greening of society*. In fact, the greening traces its roots back to the formation of this unconventional field of the environmental theory. The greening of society (along with its globalization and informatization) is among the most characteristic modern trends of the world community development.

To a large extent, thanks to the innovative potential of social ecology ideas and methods, the humanity has been able to effectively work out a sustainable development strategy [19, 20], and today it is a truly unprecedented case for all planetary civilization, as it has been recognized globally, in particular, in the United Nations documents [21— 27].

Of particular interest is the unique role of integration of scientific and technical knowledge in the formation of universal information concepts in science and in society as a whole. Before the beginning of the 20th century, the concept of information, in fact, had no specific content in science and, accordingly, practically was not used by scientists. As A.D. Ursul, Full Member of the Academy of Sciences of Moldova, put it, the first attempts to study this concept started as early as in the 1920s in the theory of journalism [28]. The formation of information theory and cybernetics fundamentally changed the situation and significantly contributed to the development of the STR, with the information (or computer) revolution [29] being its crucially important part. In the second half of the 20th century, in the scientific picture of the world, information has been occupying one of the top places, alongside matter and energy [30], inasmuch as this conception integrates the idea of diverse information phenom-

ena of the nature, society, engineering, technology, and the human inner world.

As a result of this revolution, the category of information became the basis of a special cognitive approach as an essential and even necessary component of a modern, general scientific methodology, the information approach [31]. By its nature, the information approach in science (as well as systemic, structural, functional, model, probabilistic, algorithmic, and other general scientific approaches) has a deeply integrative character and is organically linked to the transdisciplinary interaction in the creativity of scientists and the inter-sectoral synthesis of knowledge. At the same time, each of these approaches inevitably generates radically new scientific information that, in some way, discovers the meaningful properties of various objects of very different (one and all) spheres of the reality.

However, this was a purely scientific (more precisely, research and methodological) aspect of the problem. Its social innovation content became clear a little bit later, as the pace of development of electronic computers was getting faster and faster and new generations of computers were introduced as basis of paperless computer science [32]. The widespread implementation of integrated circuits in the basic technological equipment of industry and construction, transport and communication, forestry and agriculture, medicine and health care, education, culture, industry and service, etc. has opened the way to the cutting-edge information technologies in almost every field of social life. These transformations, without exaggeration, have become an essential component of the information revolution at the planetary level. In other words, information is now a powerful tool not only for the cognition but also for the transformation of reality.

The innovative role of this powerful process in science and practice is well evident, as exemplified by modern publishing technologies [29]. The whole mankind history proves that the book is much more than an ordinary form of paper embodiment of information and one of its many sources in society. It is a huge cultural asset of the society, which is intended to satisfy human spiritual needs and, at the same time, contains information as a resource for the further development of the individual and the society as a whole. In this context, Marshall McLuhan's famous position on the historic end of the Gutenberg Galaxy [33] needs to be seriously revised. It is a different matter that, with time, the book will inevitably undergo physical transformations and acquire new properties. Today, its fate and strategic prospects depend on the progress of informatization and digitalization of socio-economic processes.

The constitution of information economy as a particular branch of modern science is, undoubtedly, one of many outcomes of this revolution. In the conditions of gradual deepening of the informatization of society, this branch of economy and respective scientific discipline should have emerged as a manifestation of spreading information approach in science. On the one hand, the separation of a new discipline is an indisputable, quite obvious manifestation of differentiation of science. However, on the other hand, the content and the nature of this field of knowledge lead to integrating the previously separated sections of scientific theory: economic knowledge, management, and information, which is a sign of integration of science. In the context of the foregoing, it is a transdisciplinary, cross-sectoral synthesis of scientific knowledge that is the most productive and the most valuable from a methodological point of view. It should be noted that definitely, this moment has certain heuristic opportunities that have the potential and the prospect of realization [34].

It should be noted that the information approach to the knowledge of reality (as one of the phenomena of the information revolution) was formed in the second half of the 20th century. One way to demonstrate this phenomenon is to analyze the scholarly research works by V.I. Vernadsky. His fundamental research is known to combine history and philosophy of science. One of his most famous works, *Scientific Thought as a Planetary Phenomenon*, underlies the principles of the

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noosphere doctrine. The subject index compiled to this book in the 1970s covers more than 500 concepts, not only the natural sciences, but also the socio-historical, philosophical, and methodological analysis of the development of science. Among them, there are the most important concepts of science studies and methodology: science, scientific thought, scientific thinking, scientific truth, scientific knowledge, scholarly research, scientific creativity, scientific problem, scientific concept, scientific theory, scientific discipline, intuition, and many others. The concept of information (or scientific information) is not mentioned in the index [12].

Nowadays, step by step, the sphere of information economy will gradually become one of those unconventional sections of scientific theory, which are intended to analyze the real economic life of society through the prism of information concepts of the present and the basic paradigms of the information approach [31]. Even in the first approximation, one can see the organic connection of this new discipline with the strong tendency towards integration of scientific knowledge in the STR era. This is a fundamentally important thesis that largely allows us to understand the logical and methodological nature of new theoretical entity, its integrative and synthetic character. It is important to realize that this particular feature of the new economic (and at the same time information related) discipline must adequately reflect the specifics of today's socio-economic realities.

Another significant methodological thought links the scholarly research and the socio-practical components of the real development: the original content and heuristic orientation of scientific integration very often give rise to innovations in science, technology, economics, and social practice. In general, this significantly enriches the innovative potential of economic knowledge, since in this aspect the conventional sectors of the economy cannot be compared to the qualitatively new sections of the theory, such as *ecological economy* or *tourism economy* [35, 36].

In turn, the greening of economic knowledge is a clear example of how the integration of different fields of science determines not only fundamentally new and important theoretical positions, but also socially significant innovations. The heuristic charge of society's informatization, its creative, scientific, and methodological potential appear to be productive enough, in this aspect. By the way, the concept of ecological information and related (directly and indirectly) scientific issues is a kind of semantic bridge that clearly combines the newest disciplines of the economic knowledge. Especially this is evident when studying certain specific problems, for example, in connection with the deepening of the concept of the World Environmental Constitution and its significance for the future of humanity [37, 38].

While considering the methodological role of informatization and greening of society in initiating the information economy as a particular scientific discipline, it is necessary to mention one more strategic trend in the global community development, which is called globalization. As V.I. Vernadsky put it, for the first time, the human being realized that he was a resident of the planet and could/should think and act proceeding not only from individual, family or dynasty, national or international interests, but also *in a planetary aspect* [12]. Indeed, in their communication and interaction, the globalization, informatization, and greening of society make a great contribution to understanding the nature of today's realities. In the context of the analysis, it is important to mention that globalization has already become the object of study of a special branch of science, globalistics or global processes studies. To a large extent, this original discipline appeared thanks to integration of scientific knowledge.

Research on the formation of information economy is interesting and useful in one more aspect. Due to the exceptional importance of the main theoretical and methodological characteristics of this discipline, it becomes possible to address the interfacial issues of modern R&D and innovation policy. Some promising results of heuristic cha-

racter, which might be obtained by deepening the inter-sectoral synthesis, first of all, at the intersection of the informological and economic planes of scientific theory, due to the study and integration of its various forms and instruments may enable the complete assessment of innovative effect of information economy.

At the same time, it should be noted that the virtualization of economy, which is typical for the conditions of new economic reality, gives rise to completely different specific phenomena. On the one hand, it is *financialization* that changes not only the resource component, but also the main sources of nutrition of the economy. On the other hand, there is the phenomenon of *creativization* that modifies the product, productive forces, and other factors of production. However, it should be pointed out that these components do not have the desired effect unless they are interconnected.

Financialization is considered to be a result of the growing role of financial capital before the Great Depression in the 1920s—30s [39, 40], although as far back as at the origins, the fathers of the United States had understood and mentioned a huge but negative role of the financial sector [41].

The phenomenon of financialization is caused by a huge increase in the number of financial flows, institutions, market professionals, and their impact on the redistribution of national revenues, the revitalization of the real sector, the labor market, the economic policy-making, and the financial behavior of individuals. It should be emphasized that the finance started to grow in terms of both size and role as early as in the 1980s, as a result of developing digital technologies that have dramatically changed not only the world of finance but also the consumers of financial services. Thomas Philippon noted that the financing of the IT revolution marked the third stage of financial market [1] growth and led to an increase in the financial sector share from 4% in the late 1970s to 8.3% in 2006 [42]. Other significant milestones in this context are the conceptual visions of Full Member of the NAS of Ukraine, the leader of the national scientific school of financial globalism O.G. Bilorus, on the hyperfinancing of the world economy [43], Full Member of the NAS of Ukraine T.I. Iefymenko, on the fiscal and monetary security of the national economy [44], and S.S. Hasanov on the fiscal rules and responsibilities in the context of economic security [45].

In recent decades, the virtual financial world has exceeded several times the real one due to the active use of mortgages, derivatives, the growing role and scope of speculative transactions in the financial (primarily, stock) markets, the diffusion of financial innovation, that is, the creativization of financial system. Financial product innovation became a phenomenon that needed creativity as a condition for the development of the financial system. The main feature of creative product that is the possibility of increasing its value due to intangible component has begun to be a prerequisite for the implementation of effective operations in the financial market.

The concept of *financonomics* describes all the diversity of phenomena generated by financialization fueled by creativization and informatization. Financial activity has shifted to a virtual sphere that is not backed by any material assets [46]. There is an opinion that the macroeconomic level of financonomics manifestation that is characterized by the outflow of capital from the real sector to the financial one, which leads to growing share of the financial sector in the gross domestic product; expanding electronic money and means of payment; and increasing amount of shadow financial transactions, especially those with the use of derivative financial instruments [47]. The microeconomic level at which there is strengthening financial control in business structures; the share of financial assets in the balance sheets of non-financial corporations grows; the financial market trends are a determining factor in the formation

[1] The first stage covered the period between the 1880s and the 1900s and was driven by the need to finance railways and heavy industries. The second major increase in the size of the financial market was dated between 1918 and 1933, in connection with the financing of the development of electricity, automotive and pharmaceutical industries [49].

of business strategies; the share of the fictitious component in the capital of corporations grows; financial institutions' income grows faster than on other areas of business; financial incentives for financial sector CEOs and top managers exceed those in non-financial corporations [41]. It is worth noting that at the macro level there is a phenomenon of "invisible" cross-border cash flows, which makes financonomics almost devoid of national peculiarities, removes finances from the control of the government, weakens the effect of practically all instruments and measures of government regulation of the economy.

As financonomics starts to dominate, the world of money becomes more powerful, expands over more and more countries, the role of the government institutions and their impact on the economy decreases as they are replaced by supranational institutions. The real economy is getting weaker and geographically limited. Digitalization (informatization) changes not only the resource component, but also the product itself, the way it is offered and promoted in the market. The digital economy spans manufacture, commerce, communications, public administration, and so on. It requires an appropriate digital infrastructure that includes telecommunications and information technology, electronic money transfers, e-government, smart city, digital agro-production, e-commerce, distance learning and other advanced forms of education, digital medicine, new approaches to research and innovation, changes in the social paradigm and social relationships, including the use of artificial intelligence and smart technologies. The economy is the most influenced by digitalization, which causes the emergence of a new term *digital economy* in the scientific discourse. Digital economy is long-wave transformations of socio-economic evolution of structural units, which manifest themselves in the achievement of peak indicators of innovative development [48].

The recent survey of the Organization for Economic Co-operation and Development (OECD) on digital transformations in Sweden has noted that growing supply of digital services opens up new markets, on the one hand, and enhances competition, including at the global level, on the other hand. In the conditions of digitalization, the pace of productivity growth slows down, but investment in knowledge remains high and can be used more effectively for driving innovation. Big data and artificial intelligence enable creating new business models and new services, but require efficient management of digital risks and confidentiality. The accommodation policy has become important to reap the benefits of digital transformation while maintaining social values [49]. Thus, the markets, products, society, nature of business processes, manufacture, investment, and management undergo transformations, and so does the globalization. The most recent documents on establishing the regulatory and institutional framework of digital economy in the context of economic development are the deliverables of the G-20 Summit in Osaka, Japan, in 2019. In particular, the Osaka Declaration on Digital Economy [50] emphasizes the need for a broader dialogue on utilizing the potential of digital economy for innovation and ensuring rapid development while maximizing the benefits of digital technology. At the same time, the keynote statement of the summit contains a separate section, *Innovation: Digitization, Free Access to Information with Confidence*, that stresses the importance of innovation to achieve the UN Sustainable Development Goals and their suitability for inclusive, sustainable, secure, and trustworthy communities through the use of digital technologies and information. In this context, it has been proposed to continue the discourse on the modernization of World Trade Organization (WTO) relations regarding the institutionalization of e-commerce. At the same time, it emphasizes the commitment of the leading countries to a human-centered society. Japan calls it *Society 5.0*, as logical extension of *Industry 4.0*. Also, in this context, it is important to mention the challenges that are naturally associated with confidentiality, data protection, intellectual property rights, and security. Response to these risks

is an emphasis on safe regulation based on the OECD Guidelines developed for using artificial intelligence, developing the Internet of Things, small and medium-sized businesses, protecting vulnerable strata of the population, and ensuring the adequate local governance, in particular, in smart cities [51]. Thus, supranational regulators and leaders being aware of the radical transformations of socio-economic relations at the present stage, try to neutralize the inherent challenges of uncertainty in socio-economic development, in particular, to counteract the risks of alienating the new economy from the social essence of the human being through the digitization and financialization of the social environment.

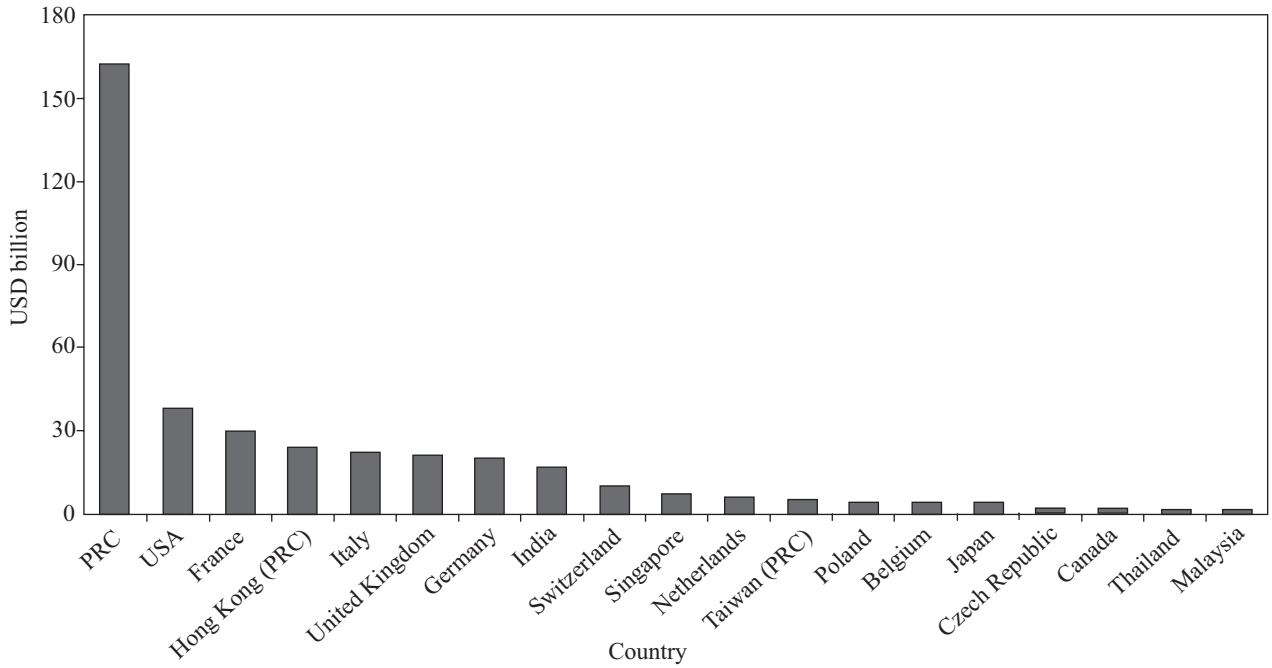
In the labor market, digitization has triggered major structural transformations making certain professions unnecessary and creating new professions and jobs. At the same time, it should be noted that the level of requirements for specialists involved in the field of digital economy is growing and needs creativity as an absolute characteristic of the candidate for the respective position. The complexity and speed of business processes increase, and so does the cost of wrong decisions.

Digitization is adding more volatility to all markets: commodity, services, financial markets and markets of administrative services, due to the increasing complexity and multiplication of interconnections between economic counterparties. In the digital economy, a huge number of innovative creative products leads to the emergence of new varieties of products, including those based on the modernization of the socio-economic relations paradigm and the creation of new institutions, such as: *BioTech, BlockChain, Digital marketing, e-ID, FinTech, GovTech, LegalTech, NanoTech, RetailTech, TeleHealth, BigData, Industry 4.0, Society 5.0, Artificial Intelligemce (AI),* and *SmartAgro* [48].

Creativization is also a noticeable trend of the modern economic development. It is, in particular, a process of gradually transforming creative skills into a factor of production and productive power, which necessitates its availability in a wide range of products to give them added value and access to capital. At the same time, the creative ability begins be treated as a paid resource and a product whose value is determined by the content of that resource.

It can be said that financialization has created the institutional conditions for the formation of a phenomenon such as creative economy. This process is characterized by the formation of significant excessive capital that "looks for" new ways, forms, and objects of investment into idea, creative concept, and other forms of virtual reality, not related to material component. In the structure of capital as a self-growing value, there is distinguished a specific component — creative capital — that is an independent object of investment. Excessive capital and unequal distribution (among economies of the world, regions, industries, etc.) can generate large-scale movement of values, financial flows and create new markets. Finally, the creative economy reproduces itself: the creation of a creative product requires creativity while giving it an additional value, promoting it in the market, creating a creative infrastructure, which multiplies money funding these processes.

Manifestations of virtualization of the economy are objective processes observed more or less often in all countries, however, with different level of development of the individual components of the virtual economy: financialization, creativization, digitalization, and (or) informatization. However, it should be noted that most clearly these mutually agreed processes manifest themselves in metropolitan areas, in global, national, and regional research and cultural centers, since there the concentration of components enhances the synergistic effect of their interaction. The objective nature of the changes taking place in the new economy is not exclusive of the involvement of public authorities in stimulating the desired structural changes and enhancing the positive trends that affect the country's sustainable development.



Export of creative products by leading export countries, 2015, USD billion
Note: based on UNCTAD data URL: http://unctadstat.unctad.org/EN/Infographics.html/ (last access; 03.12.2018).

The most important factor in the evolution of the creative economy is the organization of creative education in universities, for training specialists in both conventional (for the creative economy) and other fields of activity. The prerequisites for creativity are creative personality, creative approaches in the learning process, and the creative environment in which this process takes place. The focus should be on the person who is eager for creativity and is able to generate it, whose creative genius has influenced the trajectory of entire industries; their breakthroughs and efficiency have led to the creation of new companies and industries and completely redesigned the existing ones [52, 46].

A creative approach to the organization of training and training of professionals for creative economy should be distinguished. The first process involves the formation of a specialist who is able to think creatively, to act, to make decisions, and to put his/her ideas into practice in socio-economic activity. The second is about the training of specialists for a specific range of sectors belonging to creative economy. These processes are being updated today given a rapid pace of the development of creative economy as a sector of the national economy, which requires the formation of a relevant labor market. The boundaries between these concepts have been blurred over time, however, for the further development of institutional support for the progress of these phenomena that categorical certainty is important. In particular, it is foreseen in the amendments to the Law of Ukraine on Culture. This Law introduces "creative industries" into the national legal field and defines them as economic activities aiming at the creation of added value and jobs through cultural (artistic) and (or) creative expression, and their products and services are the result of individual creativity [53]. This implies the apparent leadership of advanced economy in terms of exports of goods with a high share of creative components, the absolute sales of creative goods in the world economy and the employment in the relevant sectors. In particular, according to the United Nations Conference on Trade and Deve-

lopment (UNCTAD), in 2015, the global trade in creative products reached USD 510 billion. The undisputed leader in the export of creative goods is the People's Republic of China, followed by the United States, France, Italy and others.

The creative economy is quite diversified: according to one approach to its measurement, it consists of 11 sectors (see Table). Television and the visual arts have the largest share in the total revenues. Newspapers and magazines are ranked third in terms of revenues and sixth in terms of employment. Significant gaps are observed in the music sales sector: it is ranked 10th in terms of revenues and is the largest behind television in terms of employment. Similar disparities are reported in book publishing. Partly, these phenomena are caused by breaches of intellectual property rights in these sectors.

Dean Baker and co-authors note that for creative works such as sound recording, films or books, scanty revenues from product distribution over the Internet does not make it possible to defray the cost of creation. Enabling the innovator by means of legal right to exclude others from the manufacture of such a product gives the freedom to set prices beyond the marginal cost, to introduce rather high prices for defraying the cost of the first copy [15]. At the same time, digitalization violates the logic and rationality of economic management in the conditions of inconsistency of infrastructure or unequal access opportunities for all members of society (*digital divide*), in particular, with respect to the possibility of protection of such rights, since the cost of creating systems for adequate protection of a creative product is sometimes comparable to the cost of creation of the product itself and time necessary to obtain a copyright considerably postpones the product positioning and presentation in the market. Moreover, for some low-income countries, the introduction of a patent and the protection of intellectual property rights are important inhibitors to the development of national creative economy. At the same time, an advanced system of intellectual property rights protection makes these countries be on the outside looking in the progress and to pay intellectual rent to advanced transnational corporate networks.

It should be pointed out that STR that started in the middle of the 20th century is still going on.

Structure of Cultural and Creative Sectors in Terms of Revenues and Employment

Place	Sector	Revenues		Employment in the sector, million employees	
		USD billion	% of the total revenues	Million employees	% of the total number
1	Television	477	20.9	3.53	11.2
2	Visual arts	391	17.1	6.73	21.4
3	Newspapers and magazines	354	15.5	2.86	9.1
4	Advertising	285	12.5	1.95	6.2
5	Architecture	222	9.7	1.67	5.3
6	Book publishing	143	6.3	3.67	11.6
7	Performance art	127	5.5	3.54	11.2
8	Games	99	4.3	0.61	1.9
9	Cinematography	77	3.4	2.48	7.9
10	Music	65	2.8	3.98	12.6
11	Radio	46	2.0	0.50	1.6
Total		2285	100	31.52	100
Total (except for double count)		2253		29.51	

Note: based on [54].

This means, in particular, a gradual increase in the role of technical disciplines and their involvement in the overall synthesis of knowledge. Therefore, the integration of scientific and technical knowledge is a very specific and significant factor in the constitution of new forms and methods of cognition of economy and determination of possible innovations of various kinds, in this semantic context.

The rather original content of this approach gives hope for further productive development. One of these areas is the synthesis of science and the real economy, which gives rise to many interesting phenomena of the categorical nature in the context of the determination of information economy. On the one hand, it goes about the virtualization of the global economy and public relations in terms of the use of productive forces and means of labor, particularly, information, knowledge, and simulators such as digital financial instruments and cryptocurrency (virtual currency). In this way, in a certain way, there is structured *the information-knowledge sphere* that directly forms the cognitive methodological potential of the new economy based on the use of modern science, innovative potential, and new knowledge. On the other hand, the special market infrastructure that serves the information sphere and its satellites is getting more and more complicated and diversified. This information sphere is tangible in terms of its constituting elements and the resulting products, but it is fed by intangible information flows and their derivatives. In our interpretation, it is expedient to define this area as *information infrastructure sphere*. It establishes the technical, technological, regulatory, and organizational components of socio-economic relations for the practical application of R&D results. Finally, studying a new resource generated by information and transformed (by human being) directly into a new creative product, we distinguish the human-centric approach associated with the existence of a new quality person *Homo creativus* and new socio-economic relations in the context of information and creative economy. Modern economic knowledge uses the human creative abilities and focuses them on meeting the relevant needs of the highest level, in particular, on ensuring the preconditions for sustainable development.

Therefore, given the continuous modernization of global socio-economic relations, the objective development of the economy as a sphere of social activity, the evolution of its methods of cognition and other instruments, it is advisable to intensify the professional discourse on the structure of the so-called digital economy. In our view, its main forms (aspects, planes) are information and infrastructure (*virtual economy*, *BioTech, BlockChain, digital marketing, e-ID, FinTech, GovTech, LegalTech, NanoTech, RetailTech, TeleHealth, BigData, Industry 4.0, Society 5.0, Artificial Intelligence,* and *SmartAgro*), information and knowledge (science and education, semantic-cognitive innovations, *BigData*), and information and creativity (copyright and related rights, creative industries). The last two components have been institutionalized in information economy. This approach enables a balanced study of historical and methodological aspects of economic science transformation in accordance with the objective prerequisites of social life and practice and a clear identification of promising directions of knowledge integration based on information approach.

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НОВА ЕКОНОМІКА: ЕВОЛЮЦІЯ ФОРМ ТА МЕТОДОЛОГІЇ ДОСЛІДЖЕНЬ

Вступ. Доба науково-технічної революції якісно змінила зміст та співвідношення процесів інтеграції та диференціації науки, сприяла розвитку міждисциплінарного дискурсу у сфері наукового пізнання, зокрема у визначенні форм та методології досліджень, притаманних сучасному етапу еволюції економічної науки.

Проблематика. В синтетично-інтегративних тенденціях розвитку економічних досліджень відчутно позначилися активні імпульси наукової евристики, завдяки чому формуються перспективи й орієнтири для еволюції форм і методів пізнання. Одним із таких феноменів є формування парадигми нової економіки (від економіки інформаційної

сфери до цифрової економіки) як особливого напряму теоретичних та прикладних пошуків. В останні роки в науковому середовищі активно йдуть процеси концептуалізації феномену неоекономіки та її структурних елементів.

Мета. Узагальнення, структуризація та систематизація процесів розвитку явища креативізації традиційної економіки як інтегрального чинника (стимулятора) особливих форм (віртуалізації та типологізації) та методів (дигіталізації та фінансіалізації) у сфері пізнання соціально-економічних відносин.

Матеріали й методи. Ретроспективний аналіз контексту та напрямів застосування інформаційного підходу в процесі інтеграції, внутрішньо- та трансдисциплінарного синтезу.

Результати. Усвідомлення нової інформаційно-економічної реальності, її пізнання та оновлення засад системних досліджень сприятиме вирішенню принципових питань формування та реалізації ефективної економічної, науково-технічної та інноваційної політик. Креативна економіка та розвиток економіки інформаційної сфери розглядаються поза традиційними межами галузей культури та цифрових технологій. Запропоновано комплексне бачення наслідків їх взаємного перетину, обміну рішеннями та інструментами в різних сферах суспільної практики, що розвиває категоріально-понятійний апарат та методологічні засади проведення наукових досліджень соціально-економічних відносин у сучасному суспільстві.

Висновки. Для стимулювання розвитку нової економіки необхідно ідентифікувати фактори, що сприятимуть еволюції форм і методів наукового пізнання, трансформації традиційних соціально-економічних відносин у продуктивні ресурси нової формації.

Ключові слова: інтеграція науки, наукова евристика, інформаційний підхід, економіка інформаційної сфери, цифрова економіка, креативна економіка.