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TECHNOSCIENCE AND DIGITALITY: AN EPISTEMOLOGICAL ANALYSIS OF INTERACTIONS

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In the article, the phenomenon of technoscience is investigated in the context of a mixed relationship with digitality at the modern stage in a philosophical-scientific aspect. The analysis reveals that "technoscience" represents a novel cognitive phenomenon, closely intertwined with the fundamental mechanisms of scientific comprehension as a whole. Therefore, it is essential to investigate technoscience by considering both its cognitive and socio-cultural dimensions within the philosophical-scientific framework. Adopting an interdisciplinary approach that harnesses synergies can prove beneficial in this endeavor. In that context, the possibility of using the cognitive principle called "paradox of creativity" defined by one of the authors of the article is considered. For this, the principle of "double contingency" introduced by T. Parsons and also investigated by N. Luman and Y. Hui is applied.

Scientific Purpose: *The primary objective of the study is to attain a philosophical-scientific comprehension of the relationship between technoscience and digitality.*

Methodology: *In the article, synergetic-centered interdisciplinary methodology was used. In this framework, the methodological principles of non-linearity, intersubjectivity, synergetic synthesis and formation are taken as the basis.*

Method: *Differentiation of differences, synergistic synthesis of subsystems and double contingency methods are applied.*

Scientific Innovation: *The study introduces a novel investigation of technoscience-digitality relations, employing the "paradox of creativity" as a guiding principle and viewing these relations through the lens of the "double contingency" rule of understanding.*

Keywords: *creativity paradox, double contingency, NBIC-convergence, polysubjectivity, reflexivity, multiparadigmality, number, implicit knowledge, codification of knowledge.*

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INTRODUCTION

As we entered the 21st century, philosophical-scientific understanding embraced the dominance of the sophistication paradigm. The notions of "complexity" became prominent in scientific cognition during the latter half of the previous century. Within just a few decades, these concepts assumed a dominant role in the field. Towards the end of the 20th century, the renowned physicist Stephen Hawking's prediction that "the next century will be the century of complexity" became frequently cited in contemporary philosophical and scientific literature. Philosophical-scientific cognition is already recognized as a "complex phenomenon" in nature and essence. From a philosophical standpoint, "complexity" has been defined in various ways, reflecting its distinctive nature and how it is perceived in scientific contexts. However, in this article, we take the synergistic understanding

of complexity in the context of Edgar More's complexity or "thinking in formative complexity" paradigm, following V.I.Arshinov and V.G.Budanov, without referring to its other meanings [1, 2, 3]. On a more concrete philosophical-scientific level, it means "thinking in differences". Or it means accepting the existence of differences in thinking, provided that the unity and mutual relations of different thoughts are maintained. This understanding of complexity entails creating a comprehensive network of knowledge, fostering close interactions between different scientific fields at a theoretical level. Complex and complexity thinking is formed "actively in the problem- and innovation-oriented cognitive-project practices of the 21st century" [1-2, p. 50-51]. So, for us in this article, the meaning of increasing complexity in the conditions of increasing diversity is more important. This principle serves as a fundamental aspect of biological, technological, social, and cosmological evolution. In this context, "the synergistic convergence of knowledge, research, and project practices, along with information-communication, nano, bio-technologies, and cognitive sciences (or NBIC-Convergence-F.G., V.Z.)," emerges as one of the primary factors contributing to this growth [1, 2]. This includes social and humanitarian sciences.In turn, the integration of socio-humanitarian knowledge into the framework of synergistic convergence (characterized by synergetic synthesis and knowledge integration) demands careful consideration of its inherent ambiguity, polysubjectivity, reflexivity, multiparadigmality, and heterogeneity [1, 2]. The article primarily examines complexity within the context of the interconnectedness of cognitive and socio-cultural, scientific and technological processes, emphasizing their unified interactions. This theoretical-conceptual expression is observed through interdisciplinary projects, socio-humanitarian expertise, and the interrelations of technoscience. At a broader level, the article delves into the philosophical-scientific understanding of the global anthropo-socio-technological co-evolution, wherein the transdisciplinary research strategy for comprehending such intricate realities becomes crucial. In light of these considerations, philosophers discuss "the emergence of a new type of thinking - complexity thinking" [1-2, p. 6-8]. Thus, in this article we approach the understanding of “human-dimensional” systems in the conditions of Digital Culture against the background of the formation of Technoscience at the general level, the convergence of Natural Science and socio-humanitarian sciences through the prism of the content of complexity thinking. In this case, the synthesis of anthropo-socio-technological coevolution in the framework of a single theory on the basis of interdisciplinary, multidisciplinary and transdisciplinary study of knowledge is considered as the main epistemological condition. Such a setting of the issue requires a synergistically focused interdisciplinary approach. We utilize methodological principles such as non-linearity, intersubjectivity, and synergistic synthesis to frame our research. Within this interdisciplinary framework, we implement differentiation of differences, synergistic synthesis of subsystems, and double contingency methods to address the emphasized principles effectively.

MAIN PART

Devi Kevin, in his article "What's Kun's problem?", highlights in his article - there is a point of view in scientific understanding that " makes coming to see the world differently a deliberative process that". In this view, it is not considered correct to imagine this or that paradigm as an immutable system, on the contrary, it is considered as an "object of discussion" that calls into question the inclusion of the existing canon in the future paradigm [4, p. 112]. There are positions similar to this. For example, the Swiss philosopher Paul Hoyningen-Huene believes that "...there are situations in the history of science in which the conviction of scientists about a certain hypothesis is so strong that they treat it as fact. Nevertheless, this hypothesis may be abandoned at later times" [5, p. 69]. Philosophers connect paradigm innovation with a person's cognitive attitude towards the world as a whole. It goes beyond the realm of intra-science or the interaction between science and culture as separate systems. The ontological context of human cognitive activity, and even the universe at large, plays a significant role in this understanding. Canadian philosopher Nick Overduin introduces

the term "post-religious peace" to explain paradigmatic innovations in general. He sees scientific paradigms as attributes of a unified cognitive process, encompassing both cognitive and social aspects. He writes that for the formative aspect of human knowledge" the ongoing development of contemporary cosmization, a new epistemological paradigm of post-religious humility is replacing religious versions". The main philosophical concept here is that a person's scientific activity is not only shaped by their human existence but also heavily influenced by the context of "cosmization." In this sense, "post-religious peace" can lead a person's relationship with themselves and the world to a path free of creative contradictions. As a result, " new stance of post-religious humility therefore summons humanity to relinquish being anthropomorphic" [6, p. 145]. One of the important points in the context of the emergence of new sciences in this approach is that, according to N.Overduin, "The question as to which paradigm is "better" is ultimately inexpli-cable " [6, p. 146]. That is, against the background of D.Kevin's approach, the emergence of new knowledge, theories, scientific paradigms, and sciences as a whole are not relevant in the logical context of slogans such as "which one is better in the end", where the main thing is deliberativeness and deliberativeness, such as gestalt proceduralism. Within the context of these conversations, we can consider "technoscience" to be an emerging phenomenon on a human scale. For us, the epistemological and methodological significance of this element of the issue is significant, because there is an opportunity to synthesis the concept of perpetual innovation with scientific-epistemological succession in the construction of technoscience. They claim that French philosopher Gaston Bachelard first coined the term "technoscience" in 1953. The popularity of this word is credited to Belgian philosopher Jilber Ottua [7, p. 46]. But in 2018, J.Ottua emphasized in the article he wrote about the origin of the term technoscience and its meaning at the modern stage: "I have a long-standing relationship with the noun "technoscience." In recent years, I have been concerned with its evolution and connotations, since the period when I first thought it up" [8, p. 121]. It is a fact that J. Ottouan's ideas about technoscience are given a wide place in the philosophical and scientific literature. J. Ottua separates the concept of technoscience into 4 major aspects: 1. Technologies play a crucial role in modern science and they are widely applied; 2. Man's attitude towards the world and space changes, man aspires to constant transformations and manipulations; 3. The attitude towards the future changes, it is imagined openly and transparently; 4. Technoscience is such a force that it is infinitely "written" and expanded into the past, the future, and also through space [8, 9]. J.Ottua underlines the fact that technology is a multifaceted reality. It can no longer be described using the "science-technology" combination. He cites the absence of demarcation between basic and applied research in scientific laboratories as the explanation for this. This indicates that in technoscience, science and technology are naturally integrated and hence constitute oneness, according to J.Ottua. Science and technology can theoretically be separated in technoscience. It turns out that a completely new science has emerged in terms of quality and function, capable of having its own essence and functions within the context of digital culture. Because digitality has a direct impact on and even "creates" science and technology.

In the underlined context, J. Ottua states that the objectivity of modern science is in its effective technical actuality [8, p. 261-265].

In conclusion, we can state that technoscience, as defined by J. Ottoya, is the mutual penetration of science and technology to the point where they are inseparable and constitute a single entity [7, p. 46]. In the Great Oxford Dictionary, as an example of the penetration of science and technology into science, technoscience is indicated that "a single discipline has emerged": fundamental problems are applied in solving technical problems, and technical knowledge is applied in solving fundamental scientific problems [9, 10]. There is an intriguing philosophical generalization of such viewpoints as well. V.E.Terekovich's generalization is of significance to us. He suggests a "ontological pluralism model conditional on existence inheritance." "Every essence is a derivative of some structure and, in turn, creates new essences and structures," according to this definition. Finally,

structures and essences at each degree of complexity acquire the potential to partially operate and exist to some extent independently of previous levels' structures and essences [13, p. 149-150]. Upon applying these philosophical theses to the notion of "technoscience," it becomes evident that this novel discipline has assimilated aspects of existence and functionality from preceding levels of structure and essence. At the same time, the unity of science and technology in technoscience has introduced new nuances to philosophical and scientific thinking in this area. This cognitive, socio-cultural, and methodological approach transforms technoscience into a subject of analysis within the realm of philosophical-scientific cognition at large. The discussions of modern philosophers on this side of the matter show that our caution is not accidental.

The crux of the matter is that within the broader tradition of philosophical-scientific thinking, science has long been regarded as the primary path of rationality. Science actually programs the public consciousness in the course of epistemic and technological optimism. In light of this context, there is a growing emergence and spread of "non-critical belief in technoscience as the ultimate method for resolving all challenges and problems confronting humanity" [13, p. 7].

Indeed, this phenomenon can be seen as a manifestation of "scientific imperialism." The underlying causes of this issue are related to profound scientific and socio-cultural factors. Researchers characterize technoscientific imperialism as the expansion of scientists' influence into spheres beyond their own spheres of interest. Expanding this thesis further, we can envision "techno-scientific imperialism" as the aspiration of the scientific and technocratic worldview to exert dominance over all of humanity. A significant issue also arises in this situation: it is hard to predict in advance the risks caused by the politicization of scientific knowledge, including the great influence of scientists on political decision-making! Because of this, opponents of "scientific imperialism" advocate for a "broad expertocracy." However, supporters of "scientific imperialism" argue that science can protect society and cognition as a whole from populism. H.Collins and R.Evans write in this regard: “The risk of populism is ever-present in democratic societies. Herewe argue that science provides one way in which this risk can bereduced. This is not because science provides a superior truth butbecause it (a) preserves and celebrates values that are essential for democracy and (b) contributes to the network of the checks and balances that constrain executive power” [14, p. 200].

Those in the opposite camp consider that restricting scientific professional expertise to deliberative processes is more appropriate. It is possible to discern openly "what is close to the truth and what is far from the truth in the opinions of professional experts" because to the deliberative nature of expertise [15, p. 763].

The position between absolute faith in technoscience and distrust (scientific absolutism and populism) is considered more correct. It is believed that in addition to absolutizing science, it is possible to get rid of denialism, which is opposite to it (denial of the existence of scientific consensus outside the normative framework of scientific discipline) [13, p. 8]. According to this perspective, the viewpoint of V.E.Terekovich that was previously mentioned can "eliminate" both extremes. Overall, it is evident that understanding the phenomenon of technoscience in the framework of anthropo-socio-technological co-evolution is possible from both a philosophical and scientific standpoint.

Other aspects of technology can be emphasized. However, given the context of the principles discussed above, it is sufficient to limit ourselves to the theories of French philosopher Bruno Latour and American Alfred Nordman. According to B. Latour, technoscience is a "union of heterogeneous actors." Heterogeneous, that is, it is used in the system of elements with different composition. People, science, nature, society, economy, and politics are all seen as heterogeneous players by B. Latour [16, p. 7-34].

According to A. Nordmann, technoscience "caused an epochal shift in research culture." Technoscience, according to the American philosopher, is a hybrid phenomena that "throws down the gauntlet" to the old dichotomy of nature and culture. Therefore, theoretical concepts in techno-

scientific research cannot be separated from the material conditions of knowledge creation in principle [17].

In the background of all these discussions, a number of philosophers advanced theses about the essence and purpose of technoscience in digital cultural conditions (the most contemporary stage of creation of computers, artificial intelligences, robots, etc.) within the framework of human-science relations by delving deeper into philosophical, sociocultural, and psychological-spiritual perspectives. The Korean philosopher Y.Hui had some intriguing views at the time. J. Smonden, one of the founders of the philosophy of technology, asserts that "we cannot understand the relationship between man and machine until the concept of machine is reduced to an economic category" [32]. He bases this claim on his belief that understanding technology itself is at the core of understanding the phenomenon of technoscience.

In other words, there is a need to consider the philosophical implications of relationships between humans and machines, computers, and artificial intelligence. A more delicate situation is developing as a result of the greater and deeper application of digital technology to society. Therefore, "creative destruction" (J.Schumpeter) occurs when common people have access to such cutting-edge technologies.

Its tangible manifestation is the formation of a contradiction, or at the very least an inconsistency, between the rate at which new digital things are created and the philosophical understanding of their potential repercussions. In the framework of that logic, one can think that every serious achievement of technoscience in the era of digitalization, on the one hand, creates society (develops, creates progress), on the other hand, destroys something somewhere.

The convergence of science and technology in the age of digitalization, it turns out, actually generates a new sociocultural environment where numbers become the primary means of communication. Y.Hui refers to this concept as "cosmotechnics" in general. Y. Hui provides the following explanation of that concept's primary ideas: As new technologies are adapted by other cultures, those cultures develop them in line with their conceptions of space and man. By mastery, Y.Hui implies embracing contemporary technologies in a way that allows us to turn them into a "function of intelligence" and a part of ourselves [11, 12, 26]. This already means the adoption of new technologies, Digitalism, as an immanent element and function of existence on individual, public and cosmic scales.

This concept can be interpreted in the context of the cosmotechnical epistem. In reality, this means developing a new epistemology. The concepts of space and man are entirely different in this epistemology. For that epistemology, relationships with space are replaced by a desire to explore it, and myth is swapped out for computers (and narratives for algorithms). Digital technologies, in other words, qualitatively transform how a person views himself and the rest of the world [18, 32].

Several studies have explored the evolution of cultural practices within the realm of technoscience, referring to it as the "digital trend of culture." According to this perspective, the impact of information technologies on culture is considered to be widespread. With the application of digital technologies, "new socio-cultural phenomena and practices are emerging" [19, p. 70-71].

All of this brings to the center of techno-science-digital culture relations in the context of the problem we are interested in, the issue of mutual relations between the phenomena of scientific creativity (creativity) and digitality. Before delving into an examination of these interactions, let's first understand the definitions of these terms.

The term "creativity" encompasses diverse interpretations and perspectives. It is commonly regarded as being synonymous with innovation. In more comprehensive analyses, some philosophers view creativity as a psychological process or an expression of cognitive capabilities. Conversely, other philosophers conceptualize creativity as an outcome and groundbreaking innovation that gains recognition from the scientific community and society at large. Consequently, there exist

psychological, historical, and historical-epistemological accounts seeking to explain the concept of creativity [20, 21, 22].

I.T.Kasavin emphasizes that the idea of creativity or creativity is always based on a concrete way of understanding a person, his connections with society and nature. Along with this, the concept of creativity (and hence creativity at the moment) performs the function of normativity, showing a person a way to form a certain attitude towards his environment. In this sense, creativity is in the status of Western culture and other universal concepts of technogenic civilization. In the context that we highlight, the concept of creativity and the concept of creativity can be taken as synonyms [22, p. 20].

That is why A.Kurri understands the creation of knowledge as "group-level activity". He writes: "... science involves the coordination of groups with different abilities to achieve common epistemic goals" (that is, "to science, to the essence of scientific activity" - F.G, V.Z.) [21, p. 2].

These concepts lead to the conclusion that it is essential to consider the communication principles and relationships between the scientific community, scientific infrastructure, and society in order to comprehend scientific creativity, or how new, valuable knowledge is produced in science [22, p. 58].

We agree with this viewpoint and would like to make one point: in this context, creativity and creativity are synonyms. For us, creativity is not only sociohistorical, but also cognitive-anthropological and methodological. At each socio-historical stage, we see innovation in the synthesis of social-practical verification and individual aptitude. At this point, the innovativeness and utility of the resulting outcome might be used as a creative criterion.

In this article, we adopt the viewpoint that creativity and innovation are synonymous concepts, and we place significant emphasis on exploring their connection with digitality, which is crucial to our research topic. Within this perspective, digitality represents the epitome of creativity, signifying the highest level of expression for innovative ideas. The extent to which digital technologies can embody knowledge in the contemporary era is recognized as a pertinent philosophical, scientific, and epistemological issue. Here, there is relevance both in terms of the formation of knowledge, its social functions, and the prediction of its possible effects on the social environment.

In light of this, we wonder whether creativity can be fully expressed by digital technology. More specifically, philosophers and scientists from various disciplines ask if knowledge can be codified to what extent. In this connection, the philosophical-epistemological understanding of the concept of "implicit knowledge" introduced by M.Polanyi takes a new direction [17]. According to M.Polanyi, new knowledge always occurs in conditions that are not completely clear. Figuratively, M.Polanyi expresses the non-obviousness of knowledge as follows: " we can know more than we can tell" [17, p.4].

Numerous researchers have elaborated on M. Polanyi's concept, exploring the idea of "implicit knowledge" across various fields. Among them, a comparative analysis of symbolically expressed (including digital) and non-symbolically (including digital) knowledge was also conducted (for example, R.Cowan and J.Kimble). R.Cowan refers to this knowledge as being "not codified" [23, p. 212]. This means the existence of non-formalized (including digital) knowledge. Codification means codification of knowledge. It turns out that there is knowledge in modern sciences that is not codified. Because their full content is not clear or expressed. This situation always exists according to modern scientific approaches. That is, it does not depend on the approach in general, it is directly related to the peculiarity of human cognition.

C.Kumple summarizes what is said about non-obvious knowledge and concludes that: “Tacit knowledge is usually described as knowledge that is either (a) inarticulable, that is, it is impossible to describe in propositional terms, or (b) implicit, that is, articulable but only with some difficulty” [24, p. 5].

Philosophers have recognized various categories of non-obvious knowledge and defined which of them are associated with creativity by taking a more comprehensive approach to the issue. According to G. Collins' classification, the collective type of non-obvious knowledge is associated to creativity. G.Collins writes that the collective non-obvious knowledge is basically "contextualized in the language of collectivism" [27, p. 29]. Specifically, this implies the existence of underlying factors deeply embedded within the collective experiences of human societies, which form a part of their knowledge. In essence, this knowledge remains unexpressed and undisclosed, making it challenging to quantify or represent in numerical terms. "The language of collectivism" is clearly related to the spiritual, moral, psychological and other features of society. It is impossible to fully algorithmize them. Numerous philosophers draw the conclusion that the collective non-obvious knowledge is "...impossible to digitize" from all of this [25, p. 38].

But can the relationship between creativity and digitality from a cognitive-methodological perspective be explained by a mechanism or a theoretical-methodological tenet? Many significant features of relations between technoscience and digital technology in general may be understood philosophically and scientifically thanks to the solution to this issue. We suggest a guideline we refer to as the "paradox of creativity" as such a concept. Thus, scientific inventions appear rapidly, but the philosophical-scientific understanding of their socio-cultural impact is delayed. That is, in the cognitive aspect, the "speed of creativity" and the "speed of creativity" of the philosophical-scientific understanding of the results of the socio-practical application of discoveries (inventions) are in a paradoxical relationship. The paradox of creativity can be briefly expressed as follows: "We can evaluate the contradiction between the creative power of scientific cognition and its creative attitude to its own product as an internal paradox" [28, p. 49].

This rule and G. Moore's law are related in several ways. In contrast to Moore's law, the paradox of creativity refers to the epistemological expression of the contradiction in the interaction of two parts of the cognitive process that are in unity with each other. Moore's law relates to the peculiarity of a certain characteristic of scientific inventions being related to the time factor [29, p.1-4].

A cognitive rule known as "double contingency" can explain the creative dilemma. This concept was introduced into current philosophical and scientific literature by Talcott Parson. It explains the cognitive, logical-psychological, and behavioral aspects of communication participants' behavior. According to T.Parsons, one of the communication participants ("ego") chooses one of the available alternatives. The reaction of the second party ("alter") is related to both the choice of the first party and its own choice. That is, concretely, it is a synthesis of these two options. T.Parsons calls this a "situation of double dependence" [30, p. 437].

Expanding on this concept, Niklas Luhmann contends that reciprocal relations involve a "double contingency" [31, p. 151]. He also refers to a "double dependence on circumstances." According to the German sociologist, the "ego" possesses the capacity to select from various available alternatives. The alter's response is influenced by both the ego's choice and its own decision. Consequently, the choice made by the alter represents a synthesis of the ego's decision. N.Luman generally applies this mechanism to culture samples. As a result, the decisions made and conclusions made are "conventional" in nature. The German sociologist sees a connection between double contingency and the mixed relationship of concepts of system, complexity, self-reference and meaning [31, p. 152].

In light of this, Y.Hui's concept of "algorithmic contingency" has an intriguing effect. According to a Korean philosopher, there are scientific objects that "do not fit recursive calculation." If the number is not recursively calculated, then we have encountered the phenomenon of algorithmic contingency. If any number is given, the recursive algorithm used to express it must be shorter than the number itself. Algorithmic contingency arises when algorithmic compactness is impossible. Thus, contingency "becomes an expression of unpredictability and uncalculability" [32, p. 168-169].

Thus, when considering the ideas of T.Parsons, N.Luhmann, and Y. Hui, it becomes evident that the paradox of creativity can be philosophically and scientifically explained within the context of techno-science-digital relations and double contingency. The mixed relationship between technology and science constitutes one aspect of contingency, while the digital expression of these connections represents the other side. If we accept these sides as "ego" and "alter" in the sense of T.Parsons and N.Luman (such a reduction is possible because those concepts are universal in the sense of N. Luman and Y. Hui and can be attributed to the cognitive mechanism of thinking as a whole), we can say that technoscience-digital relations are formed and contented within the framework of the rule of double contingency.

Finally, all of these studies lead to the conclusion that in the digital cultural environment, technoscience becomes content under the conditions of double contingency in contact with digitality and evolves in the unity of uncertainty and certainty. This, in turn, demonstrates that, along with the cosmization of modern scientific thinking, it is always doomed to take into account the specific situational aspect. As a result, the paradox of creativity, i.e., the discrepancy between the rapidity of scientific discovery and the creative comprehension of its socio-practical application, will always be present.

CONCLUSION

The analysis conducted reveals that in the modern era, technoscience represents the next evolutionary stage of human cognition as a whole.

In fact, technoscience encompasses the overall content and nature of scientific cognition dynamics.

To gain a comprehensive understanding of technoscience, the element of digitality must be taken into account.

The philosophical-scientific comprehension of technoscience in digital conditions can be achieved through the lens of the "paradox of creativity" and the principle of "double contingency."

For the philosophical-scientific understanding of technoscience, the concept of "algorithmic contingency" can play a heuristic role.

REFERENCES

1. Аршинов, В.И. Системы и сети в контексте парадигмы сложности / В.И.Аршинов, В.Г.Буданов – 2017. – 11 с.
2. Аршинов, В.И. Сложность и проблема единства знания. Проблема. 1: К стратегии понимания сложности / В.И.Аршинов, В.Г. Буданов, В.Е. Лепский – М.: ИФ РАН, – 2018. – 105 с.
3. Морен, Э. Метод. Природа Природы / Э.Морен. – М.: Канон, – 2013. – 488 с.
4. Kevin, D. What is Kuhn’s problem? // Epistemology & Philosophy of Science, – 2022, 59 (4), – p. 111-125.
5. Hoyningen-Huene, P. Is Kuhn’s “world change through revolutions” comprehensible? // Epistemology & Philosophy of Science, – 2022, 59 (4), – p. 55-72.
6. https://doi.org/10.5840/eps202360112.
7. Моисеева, А.П., Баканова, Е.А. Феномен технонауки // Вестник науки Сибири, – 2017, 2 (25), – с. 45-58.
8. Hottois, G. Technoscience: From the Origin of the Word to Its Current Uses // French Philosophy of Technology: Classical Readings and Contemporary Approaches, – 2018. – p. 121-138.
9. https://link.springer.com/chapter/10.1007%2F978-94-017-9870-9_2#page-1.
10. Hottois, G. Techno-sciences and ethics // Studies in the Philosophy of Science and Humanities, – 2004. – p. 261-265.

11. Терехович, В.Э. Структуры, объекты и реальность. Часть 2 // Эпистемология и философия науки, – 2023, 60 (1), – с. 149–165.
12. https://en. oxforddictionaries.com/definition/technoscience
13. Тухватулина, Л.А. Наука как объект веры и недоверия: феномен дениализма // Эпистемология и философия науки, – 2023, 60 (1), – с. 6-20.
14. Collins, H.M., Evans, R. Populism and Science // Epistemology & Philosophy of Science, – 2019, 56 (4), – p. 200-218.
15. Jasanoff, S., Simmet, H.R. "No Funeral Bells: Public Reason in a 'Post-Truth' Age" // Social Studies of Science, – 2017, 47 (5), – p. 751-770.
16. Latour, B. Science in action / B.Latour. How to follow scientists and engineers through society Harvard University Press, – 1987. – 276 p.
17. https://www.unibielefeld.de/ZIF/FG/2006Application/PDF/Nordmann_essay2.pdf https://www.colta.ru/articles/society/16061-yuk-huey-tehnologii-dolzhny-stat-chastyu-nas-funktsiey-razuma.
18. Hui, Y. Recursivity and Contingency / Y.Hui. – London: Rowman & Littlefield International Ltd., – 2019. – p. xv + 336.
19. Архипова, О.В. Цифровые тренды культуры: опыт трансформации культурных практик // Петербургский экономический журнал, – 2018. №1, – с. 70-76. https://plato.stanford.edu/entries/epistemology-social/
20. https://doi.org/10.5840/eps202259336
21. Currie, A. Creativity, Conservativeness & the Social Epistemology of Science // Studies in History and Philosophy of Science Part A, – 2019. – p. 1-4.
22. Касавин, И.Т., Сахарова, А.В. Креативность-не сущность, а существование! // Эпистемология и философия науки, – 2023, 60 (1), – с. 50-59.
23. Cowan, R. The explicit economics of knowledge codification and tacitness / R. Cowan, P. A. David, D. Foray // Industrial and Corporate Change, – 2000, 9 (2), – p. 211-253.
24. Kimble, C. Knowledge management, codification and tacit knowledge Information Research / C. Kimble. – 2013. – 15 p.
25. Масланов, Е.В. Креативность и цифровизация // Эпистемология и философия науки, – 2022, 59 (3), – с. 38-45.
26. Collins, H. Tacit and Explicit Knowledge / H.Collins. The University of Chicago Press, – 2010. – 186 p.
27. Коллинз, Г. Социальное картезианство и онтологическая асимметрия // Епистемология и философия науки, – 2011. № 3, – p. 17–34.
28. Qurbanov, F.M. Elmi idrakın kreativlik paradoksu // "Unikal". Beynəlxalq ictimai fənlərarası elmi-tədqiqat jurnalı, – 2014. № 1, – s. 47-55.
29. https://download.intel.com/newsroom/2022/manufacturing/Intel-Moores-Law-Investor-Meeting-Paper-final.pdf
30. Парсонс, Т. О структуре социального действия / Т.Парсонс. – М.: Академический Проект, – 2000. – 880 с.
31. Луман, Н. Социальные системы. Очерк общей теории / Н.Луман. – Санкт-Петербург, – 2007. – 644 с.
32. Хуэй, Ю. Рекурсивность и контингентность / Ю.Хуэй. – М.: Vac Press, – 2020. – 400 с.

TEXNOELM VƏ RƏQƏMSALLIQ: QARŞILIQLI ƏLAQƏLƏRİN EPİSTEMOLOJİ TƏHLİLİ

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Məqalədə texnoelm fenomeni müasir mərhələdə rəqəmsallıqla qarışılıqlı əlaqə kontekstində fəlsəfi-elmi aspektdə araşdırılır. Göstərilir ki, "texnoelm" özlüyündə yeni idraki hadisədir və bütövlükdə elmi dərketmənin ümumi mexanizmləri ilə sıx əlaqəli olaraq meydana gəlmişdir.

Bu bağlılıqda texnoelm fəlsəfi-elmi idrakın koqnitiv və sosial-mədəni aspektlərinin vəhdətində tədqiq olunmalıdır. Bu zaman sinergetik əsaslı fənlərarası yanaşma faydalı ola bilər. Həmin kontekstdə məqalənin müəlliflərindən birinin müəyyən etdiyi "kreativlik paradoksu" adlı koqnitiv prinsipindən istifadə etməyin mümkünlüyü nəzərdən keçirilir. Bunun üçün T.Parsonsun daxil etdiyi, N.Luman və Y.Hui tərəfindən də araşdırılan "ikiqat kontingentlik" prinsipinin tətbiqinə baş vurulur.

Elmi məqsəd: Texnoelm-rəqəmsallıq münasibətlərinin fəlsəfi-elmi dərkinə nail olmaq.

Metodologiya: Məqalədə sinergetik mərkəzli fənlərarası mtodologiyadan yararlanılmışdır. Bu çərçivədə qeyri-xəttilik, intersubyektivlik, sinergetik sintez və təşəkkül metodoloji prinsipləri əsas götürülmüşdür.

Metod: Fərqliliklərin fərqləndirilməsi, altsistemlərin sinergetik sintezi və ikiqat kontingentlik metodları tətbiq edilir.

Elmi yenilik: Texnoelm-rəqəmsallıq münasibətləri "kreativlik paradoksu" çərçivəsində "ikiqat kontingentlik" dərketmə qaydası prizmasında tədqiq edilmişdir.

Açar sözlər: *kreativlik paradoksu, ikiqat kontingentlik, NBİC-konvergensiya, polisubyektlilik, refleksivlik, multiparadiqmallıq, rəqəm, qeyri-aşkar bilik, biliyin kodifikasiyası.*

ТЕХНОНАУКА И ЦИФРОВИЗАЦИЯ: ЭПИСТЕМОЛОГИЧЕСКИЙ АНАЛИЗ ВЗАИМОДЕЙСТВИЙ

В.Р. Зульфугаров, Ф.М. Гурбанов

В статье феномен технонауки в философско-научном аспекте исследуется во взаимосвязи с цифровизацией на современном этапе.

Показывается, что «технонаука» представляет собой новое познавательное явление само по себе и возникла в тесной связи с общими механизмами научного понимания в целом. В связи с этим технонаука должна изучаться в единстве когнитивного и социокультурного аспектов философско-научного понимания.

Для этого может быть полезен синергетический междисциплинарный подход. В данном контексте рассматривается возможность использования когнитивного принципа под названием «парадокс креативности», определенного одним из авторов этой статьи. Для этого применяется принцип «двойной контингентности», введенный Т. Парсонсом, а также исследованный Н. Луманом и Ю. Хуэем.

Научная цель: Достижение философско-научного осмысления техно-цифровых отношений.

Методология: В статье использована междисциплинарная методология, ориентированная на синергетику. В этих рамках за основу берутся методологические принципы нелинейности, интерсубъективности, синергетического синтеза и формообразования.

Метод: Применяются методы различение различений, синергетического синтеза подсистем и двойная контингентность.

Научные инновации: Взаимоотношение технонауки и цифровизации в научно-философском аспекте впервые исследуется в рамках «парадокса креативности» через призму научно-познавательного феномена «двойная контингентность».

Ключевые слова: *парадокс креативности, двойная контингентность, NBIC-конвергенция, полисубъективность, рефлексивность, мультипарадигмальность, число, неявное знание, кодификация знания.*