POST-NON-CLASSICAL PHILOSOPHY OF TECHNOLOGIES AND CYBERNETIC ANTHROPOLOGY

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Аннотация. The article examines the tendency of convergence of the subject fields of post-non-classical philosophy of technology and cybernetic anthropology associated with digital anthropology. Post-non-classical philosophy of technology has expanded its subject field by studying intelligent cognitive systems and cognitive artifacts. Cybernetic philosophy, based on the applied interpretation of humanism, has made the subject of study and construction of a person with components of artificial origin. This is the construction of an extended person. As a result of the expansion of man, digital anthropology has acquired a research field, the main sources of information in which are digital traces and digital shadows. The article discusses the risks associated with the expansion of man and the need to transform the philosophy of security in order to strengthen the role of systemic approaches in it. This is due to the fact that the extended human body, thanks to the technologies of digital metaverses, acquires the functions of a digital ecosystem.

Ключевые слова: post-non-classical philosophy of technology, cybernetic anthropology, digital anthropology, extended man, digital environment, cybernetic security.

ПОСТНЕКЛАССИЧЕСКАЯ ФИЛОСОФИЯ ТЕХНОЛОГИЙ И КИБЕРНЕТИЧЕСКАЯ АНТРОПОЛОГИЯ

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Abstract. В статье исследуется тенденция к сближению предметных полей постнеклассической философии технологий и кибернетической антропологии, связанной с цифровой антропологией. Постнеклассическая философия технологий расширила своё предметное поле за счет изучения интеллектуальных когнитивных систем и когнитивных артефактов. Кибернетическая философия, опирающаяся на прикладную интерпретацию гуманизма, сделала предметом изучения и конструирования человека с компонентами искусственного происхождения. Это конструирование расширенного человека. В результате расширения человека у цифровой антропологии появилось исследовательское поле, основными источниками информации в котором стали цифровые следы и цифровые тени. В статье обсуждаются риски, связанные с расширением человека, и необходимость трансформации философии безопасности с целью усиления в ней роли системных подходов. Это обусловлено тем, что расширенное тело человека благодаря технологиям цифровых метавселенных приобретает функции цифровой экосистемы.

Keywords: постнеклассическая философия технологий, кибернетическая антропология, цифровая антропология, расширенный человек, цифровая среда, кибернетическая безопасность.

Introduction

The subject of the research in the article is a stable trend of convergence of post-non-classical philosophy of technology with cybernetic anthropology. The trend of their interdisciplinary fusion is due to four reasons. The first reason is created by experimental design practice. It is dominated by the emphasis on the development of neural interfaces to help people with impaired coordination, vision and hearing. These technologies inevitably create a cyborg – an individual with special cognitive devices (cognitive artifacts) that complement his corporeality.

The first reason has an emphasis that also applies to physically healthy people. It is due to the fact that cognitive artifacts have become part of the psychological world of a modern person. This psychological world has a decentralized basis. Some functions of storing data, information, knowledge, skills, and memory are delegated to mobile technical devices, despite the fact that such actions leave digital traces and a digital shadow. The user's digital traces have become the subject of study in digital anthropology, digital visual anthropology, and digital ethnography. The convergence of the human body with cognitive artifacts has created the phenomenon of human body expansion.

The second reason is created by the philosophy of consciousness, in the space of which the strategy of expanding the human brain through its convergence with artificial intelligence technologies is implemented. But there is a barrier here, which is designated as the difficult problem of consciousness. This barrier insures against the risks associated with technological singularity.

The third reason is created by the peculiarities of the market economy of a mass consumer society. In this context, the use of information technology is closely linked to the most complete knowledge of the behavioral characteristics of a potential buyer. This emphasis has created the phenomenon of behavioral economics and neural marketing.

The fourth reason was formed in the context of the pandemic. Physical spatial self-isolation has transformed the forms of labor, logistics and marketing, and accelerated the psychological integration of the individual into the technologies of digital platforms and digital ecosystems with the prospect of active interaction of his digital metaverse with the components of virtual and augmented reality through a special headset and digital twins.

Conceptual part

The subject ontology of the philosophy of technology expanded by intelligent systems is implemented by the strategies of industry 4.0 and 5.0, as well as smart industry. Under the influence of the fourth industrial revolution, Big Data, the Internet of Things, cyberphysical systems and additive technologies have become in demand. As a result, the role of ergonomics and engineering psychology has grown. The formed cognitive environment has transformed the subject field of the philosophy of technology. This subject field included not only human corporeality, but also his communicative environment. Such a transformation was provided by the logical apparatus of computer science and communication theory. This made it possible to technologically move to mobile systems of social networks. The architecture of these networks was formed. It includes software, an operating system and hardware. A. Turing updated the concept of artificial intelligence through the test he formulated.

In the development of software, there was an obvious tendency for a computer program to maximally imitate the functions of human thinking [1]. But in order to be able to imitate the functions of human thinking, knowledge from the field of philosophy of consciousness was needed. As a result, philosophy focused on topics related to humans.

Another area of applied philosophy was robotics. Robots have become popular due to the installation of industrial companies on automation of technological assembly processes. In this context, the similarity of a robot and a person is not assumed. But there are robots that imply an extension in the form of human hands. These are collaborative robots. This is a clear hint at the organoprojective concept of E. Kapp. According to this concept, technical devices are a natural extension of human hands and feet.

A new view of man contributed to the formation of the subject field of cybernetic anthropology. "Weaknesses" began to be discovered in the content of man, which contrasted with the role assigned to him as a transformer of social dynamics. Psychoanalytic anthropology began to study the internal contradictions of individual consciousness and to look for ways to help resolve these contradictions. Existentialism focused on human behavior in borderline situations. The philosophy of life focused on the study of irrational components of individual consciousness associated with will and intuition.

Gender issues were actively discussed [2]. In professional activity, a restructuring of the social functions of women and men began. Feminism became the basis for this transformation. At the same time, weak points were identified in the biological nature of man, related to the vulnerability of the human body to diseases, as well as its physical mortality. As a result, the transhumanist movement emerged. It began to place hopes on the possibilities of the philosophy of technology in increasing the resilience of the human body through its convergence with technological components.

Through transhumanism, philosophical anthropology entered the era of post-non-classical rationality. It began to actively use the terms "techno-people", "post-human", "cyborg", "extension of man" [3].

A separate subject of research was the expansion of the human body through cognitive artifacts [4]. The history of mankind has always been associated with artifacts that played an important role in the individual life of a person. This was the extended mechanical and spiritual corporeality of the individual. Dead people were buried with personal tools of labor and life not only because of the belief in the afterlife, but also because of the preservation of the integrity of the individual's corporeality. This was his body. At the same time, artifacts did not claim to have a cognitive function and were not perceived as such by the individual.

The situation changed with the advent of personal mobile technical means of communication, primarily the mobile phone. It became part of the extended human body [5]. In a specific modification, it is not lifelong for the individual. An individual changes mobile phones in order to gain access to more universal capabilities of digital communication [6]. But representatives of the digital generations are unable to stay without a mobile phone even for a few hours.

There are grounds for using the term complexity paradigm. It is formed by the conceptual developments of J. Baudrillard, F. Varela, J. Deleuze, U. Maturana, E. Morin, J. Simondon.

Convergence and divergence in understanding the phenomenon of technology are studied. The technical system is distinguished as a distinction. Technology is studied as a self-organizing process in the format of E. Morin's complex-network concept of being based on the method of complexity network thinking. The epistemological fragmentation of man and his proximity to machine beings are actualized. The observer is postulated as an active agent of network complexity. Technology is understood as a system open to cognitive development, creation of its own unique environment, language and communication method. Technical objects represent a product of self-organization of the technogenic environment, the active actor of which is man.

The post-non-classical understanding of technology is based on the principle of evolution. The defining trend is the convergent-divergent growth of complexity, as a diversity of industrial worlds and realities created by human creative activity.

The post-non-classical convergence of the philosophy of technology and philosophical anthropology occurs at the research level through the actualization of the concepts of digital trace and digital shadow [7]. This is a sociological and ethnographic aspect of studying the network environment, the subjects of which are digital generations [8]. A classification of these generations has been developed and their characteristic features of the organization of free time and professional activity have been identified. This information is actively used by companies that assume the inevitability of generational change. In this context, the phenomenon of digital socialization is actively studied [9]. Its essence lies in the fact that generations entering the social space draw information from social networks and from traditional sources of educational and upbringing activities [10]. The comparative thinking inherent in digital generations does not always give priority to traditional sources of socialization. This determines the transition of socialization to a hybrid model, in which an important role is given to digital technologies [11].

The convergence of various social factors in the context of the pandemic has made the term "new normal" in demand [12]. This term initially denoted the specifics of the evolution of the economy in the new historical conditions created by the crisis of 2008–2009. The pandemic expanded the format of the new normal with self-isolation and remote forms of labor [13]. Physical self-isolation has accelerated the transition of digital generations to the format of the gaming industry, digital marketplaces, an investment emphasis on the development of metaverses and the accompanying development of virtual and augmented reality technologies. Digital technologies have created a barrierfree virtual environment for transactions, network applications, digital twins with the opportunity to visit virtual exhibitions, performances, concerts, go shopping and travel [14].

The new space has created the topic of digital ethics and digital law. This is due to the fact that the characteristics of people not to comply with ethical and legal norms have moved to the space of social networks. These features have transformed into cyber bullying, phishing, hacker attacks on information resources and confidential information, and electronic wallets of social network users. An institute of social engineering has been formed. It is one of the components of the digital shadow economy (dark internet). These are criminal elements that take advantage of the peculiarities of age psychology. Children and older generations turned out to be the most vulnerable. Technologies of nudging, manipulation and deception are used. The goal is financial resources.

Cybernetic anthropology is focused on the creation of unmanned ground, surface, underwater and air remote control systems that combine the functions of robots and traditional technical devices and technologies. These are unmanned devices. Another direction has become the development of invasive and non-invasive neural interfaces. They integrate with the functions of the human brain and restore them in the format of extended corporeality. Chips are used, as well as special invasive microcircuits that perform the functions of a mobile phone. Much attention is also paid to the development of special helmets and digital headsets. In this context, the human brain is treated as a computer. A similar approach was developed in digital physics. Within the framework of this approach, the Universe is considered as a quantum computer. This idea was transferred to philosophy and substantiated as a digital modification of ontology.

Thus, digital metaverses are a public space of the global network, interaction with which is carried out using digital tools [15]. The users of the metaverse are digital generations. These people can create things and interact with each other in an immersive environment. It imitates reality and creates opportunities that were unknown to people in traditional everyday life. Metaverses assume the technological availability of digital space with customized avatars. They represent users of the digital ecosystem and assume the existence of digital property rights. The level of these rights depends on the degree of decentralization of the selected digital platform. The possibility of interaction with other users is taken into account. The conditions for various actions in the digital environment and the right to share leisure time with other participants in the digital ecosystem are also taken into account.

Digital ecosystems offer users different opportunities that are accompanied by specific risks. A digital platform can use a decentralized approach. It offers more opportunities for creating applications and this implies a greater range of risks. The digital metaverse creates conditions for the user in the hope of his active presence in its service infrastructure. At the same time, it offers users to realize their activity. This allows users to construct their representative function in the immersive space. The user can also determine their actions depending on their interests and motivations. In professional terms, the metaverse allows participants to build a digital career. The possibilities are limited only by digital inequality.

The technologies of centralized metaverses differ from the technologies of opensource digital platforms. The differences include control, the ability to create something, and the digital platform management system. The internal processes of a centralized metaverse are completely controlled by one organization. Internal servers and certain rules for regulating the virtual world are used. Users can interact with each other and exchange experiences. But they do not have the right to control the digital environment or own individual components.

The decentralized metaverse has an open source code. In its space, users independently determine their actions. The decentralized metaverse is associated with NFT technologies. In this case, users determine the direction in which the institutional environment will develop.

There are some technological features of entering the Internet and the metaverse. To be in the immersive space of the metaverse, you will need smart glasses attached to your head to view content, and a bracelet gadget to track your movement. The metaverse will receive signals from web browsers. The user will be able to seamlessly switch between sites on their own smartphone. Their 3D avatar will switch between digital platforms designed to ensure cross-compatibility.

The metaverse technologically implements the function of virtual visualization of technical and communication interaction processes. Its digital environment will unite the currently existing disparate solutions of augmented and virtual reality, as well as digital twin technologies. But animated presentations will not be enough for the development of the metaverse.

These structures will combine the capabilities of entertainment and platform functions. So far, the availability of this digital environment is limited by the monetary factor of the cost of augmented reality helmets and glasses.

From a legal perspective, a regulatory framework for protecting copyright in metaverses has not yet been developed. 3D models of people are relevant, including those who are no longer alive. Any user can technically create a model of an individual. Titles in the status of a digital NFT certificate will be transferred along with the token when selling avatars and what they create. It is important that no one except the copyright holders can lay claim to the avatar and the results of its activities. The user of the metaverse can make a purchase. But he must be sure that he bought it from the original avatar of the manufacturer.

The user will not be in an institutional digital environment where his rights can be violated. People prefer an environment where it is safe. But in addition to threats in the form of fraud, there are also threats of a psychological and ethical nature. This mainly concerns the gaming industry, on the basis of which the economic attractiveness of the metaverse technology is formed. The problem is that game simulation technologies can create psychological and moral problems for players, since we are talking about manifestations of aggression, violence and murder scenes.

Such values as honor, dignity, copyright will require classical methods of legal protection, including criminal law, since slander, incitement to suicide, drug propaganda require legal assessment. Therefore, the Criminal Code will operate in the virtual world, since intruders can gain access to the private life of an individual, his personal data. Therefore, the security aspect is so important. It involves decentralized storage of personal data with a single user ID. Based on the patent for a decentralized passport using NFT networks, passports of citizens of the metaverse will be created.

Many units of artificial intelligence will become potential actors in the social environment. There will be a risk of collision with an anthropomorphic model. These are neural networks with deep learning. Between them there is a "black box". The developer understands the inputs and outputs. "Black boxes" are called artificial subconscious. It allows saving computing power. Solving non-standard problems and learning faster. But uncontrolled processes of the artificial subconscious create uncertainty. This is a separate topic of research in cybernetic anthropology.

In the meantime, social networks retain their positions in communication processes. In this regard, topics of digital ethics are actively discussed. These topics include aspects related to the professional activities of software engineering, since technological support for information security depends on this engineering. The personal factor is also taken into account, since a programmer acts as a developer of information security systems, and he, knowing the features of these security systems, can use this knowledge for selfish purposes. Therefore, much attention is paid to the corporate ethics of software engineering.

Another aspect of digital ethics has created the phenomenon of social engineering. This phenomenon shows that the practice of manipulating individual consciousness for selfish purposes has become a widespread phenomenon in social networks. The practices of phishing have become widespread. In this context, the topic of digital ethics is closely related to the legal topic of protecting the interests of social network users, especially people of retirement age who trust phone calls and their content.

One of the topics of digital ethics was created by media practices of constructing and presenting information. These practices are formed in the context of information and hybrid wars. In this context, fake technologies have become widespread. One of the modifications of these technologies has become cyber bullying. The shift of the main time of communication to social networks has actualized the topic of digital etiquette.

A special phenomenon was the cognitive sciences, which, together with philosophy, created a research cluster, the subject of which was human consciousness and thinking. This cluster includes cognitive linguistics, cognitive psychology, neuron philosophy, neurophysiology, neurobiology, logic, philosophy of consciousness and the theory of artificial intelligence. The philosophy of cognitive technologies has formed.

In the space of post-nonclassical rationality, not only scientific research areas have been transformed, but also traditional sections of philosophy. The philosophy of technology is represented by the philosophy of digital technologies and the philosophy of digital design. Ethics has been transformed into digital ethics. Philosophical anthropology has been supplemented by digital aspects of sociology and ethnography, the philosophy of cyborgs and robotics. Economic philosophy has been transformed into the philosophy of the digital economy. The philosophy of law actively includes in its subject matter aspects of legal regulation of relations between individuals and legal entities in the economy of digital platforms and digital ecosystems. Many questions for the philosophy of digital law are formulated by the technologies of digital metaverses.

In futurology, the concept of future shock was concretized by the concept of technological singularity. This concept denotes a kind of point of no return for developers of artificial intelligence technologies. At this point, artificial intelligence systems will get out of the developer's control, and then the scenario of self-denial of man as a generic being will be realized. But this is one of the possible prospects.

Such a section of philosophy as ontology is transformed by the concepts of digital philosophy. In it, along with the recognition of the priority of the actual physical being in its historical modification created by the Big Bang, there is an increasing interest in potential being, which is a generator through the design activity of man of the technical environment, infrastructure, communications. This environment is represented by ecosystems of artificial origin, which actively coexist on Earth with ecosystems of physical nature. As a result, a new interpretation of ecology as a hybrid reality is being formed in post-non-classical rationality. This ecology is presented in the corporeality of modern man and social space [16]. In this hybrid, through the technologies of digital metaverses, ecosystems of virtual and augmented reality will take their place. Their role will grow. It has already determined the digital ontological theme, touching upon the traditional concepts of materialism and idealism. This does not mean that philosophy will abandon the epistemological criteria

of objectivity, but these criteria will need to be applied to the peculiarities of a person's stay not only in physical, but also in virtual technological reality.

Epistemology and cognitive philosophy in the context of the rapid development of digital technologies are faced with a transitional stage of institutionalization of convergent structures of industrial reality. Norms do not have time to be constituted against the background of technological breakthroughs. As a result, the topic of cybernetic security is acute, one of the key areas of which is the improvement of verification technologies in the space of digital communication. This concerns transactions, confidentiality access to corporate networks. The bias of artificial intelligence technologies has become a relevant topic.

A special role is given to the functions of protecting the national information space in the context of the historical era of global turbulence and the crisis of the globalization paradigm.

Conclusions

Thus, the post-non-classical philosophy of technology has abandoned the thesis of the neutrality of technologies in the social space and is actively exploring anthropology topics. The result was the formation of digital anthropology, in which a large role is given to the study of digital generations, the expansion of the human body, and digital traces left by humans. The topic of cybernetic anthropology has been formed. It has an engineering and medical focus, since devices are inserted into the human body that restore its coordination, and also replace the functions of individual organs, arms and legs. As the human body is saturated with implants, the topic of cyborgs has become relevant.

Social robotics, which integrates the achievements of mechatronics and artificial intelligence technologies, remains relevant. Visual anthropology has also turned out to be relevant, since the digital face and digital body have turned out to be in demand. Against the backdrop of new technological strategies, a new topic of legal and ethical research has emerged. In addition to the already traditional social networks and automated systems for collecting, storing and processing information, as well as production automation technologies, digital platform technologies and digital ecosystems have become widely discussed.

References

1. *Loiko A.* Generative Design and Cybernetic Anthropology of Artificial Intelligence. Experience industries. Socio-Cultural Research Technologies (EISCRT). 2024;4(9):284-304. Available from: https://doi.org/10.34680/EISCRT-2024-4(9)-284-304.

2. *Haraway Donna A.* Cyborg Manifesto. Ed. by Bell, David; Kennedy, Barbara. The Cybercultures Reader. Routledge, 2000. Pp. 291–324.

3. *Hayles NK.* How we became posthuman: virtual bodies in cybernetics, literature, and informatics. Chicago & London: The University of Chicago Press, 1999. 366 p.

4. *Downey Gary Lee, Dumit Joseph, Williams Sarah.* Cyborg Anthropology. Cultural Anthropology. 1995;10(2):264-269.

5. *Wells J.* Keep Calm and Remain Human: How We Have Always Been Cyborgs and Theories on the Technological Present of Anthropology. Reviews in Anthropology. 2014;43:5-34.

6. *Escobar A.* Welcome to Cyberia: notes on the anthropology of cyberculture. Current Anthropology. 1994;35(3):211-231.

7. *Fabian J.* Virtual archives and ethnographic writing: "Commentary" as a new genre? Current Anthropology. 2002;43(5):775-786.

8. *Boellstorff T.* Digital Anthropology. 2nd ed. California: Routledge, 2021. Pp. 39–60.

9. *Miller D.* Digital anthropology. The Open Encyclopedia of Anthropology. Ed. by Felix Stein. Facsimile of the first edition in The Cambridge Encyclopedia of Anthropology, 2018. Available from: http://doi.org/10.29164/18digital.

10. *Jiménez A.* The right to infrastructure: a prototype of Open Source urbanism. Environment and Planning D: Society and Space. 2014;32(2):342-362.

11. *Kockelman P.* The anthropology of an equation. Sieves, spam filters, agentive algorithms, and ontologies of transformation. HAU: Journal of Ethnographic Theory. 2013;3(3):33-61.

12. *Miller D, Horst H.* The digital and the human: a prospectus for digital anthropology. Digital Anthropology. 2012;3-36. Oxford: Berg.

13. *Ruckenstein M, Schüll N.* The datafication of health. *Annual Review of Anthropology.* 2017;46:261-278.

14. *Wilson S*, *Peterson L.* The anthropology of online communities. *Annual Review of Anthropology*. 2002;31:449-467.

15. *Loiko AI.* Cognitive artifacts of the metuniverse. Vestnik of Samara State Technical University. Series Philosophy. 2022;4(4):45-52.

16. *Loiko AI.* Barrier-free space of socio-cultural activities of digital ecosystems. Experience industries. Socio-Cultural Research Technologies (EISCRT). 2022;1(1):198-212.

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