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## Sustainable Development, Technological Singularity and Ethics

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**Abstract:**

*The development of modern convergent technologies opens the prospect of a new technological order. Its image as a “technological singularity”, i.e. such “transhuman” stage of scientific and technical progress, on which the superintelligence will be practically implemented, seems to be quite realistic. The determination of the basic philosophical coordinates of this future reality in the movement along the path of sustainable development of mankind is the most important task of modern science.*

*The article is devoted to the study of the basic ontological, epistemological and moral aspects in the reception of the coming technological singularity. The method of this study is integrating dialectical and system approach.*

*The authors come to the conclusion: the technological singularity in the form of a “computronium” (superintelligence) opens up broad prospects for the sustainable development of mankind in the cosmic dimension. This superintelligence will become an ally of man in the process of cosmic evolution.*

**Keywords:** *Technological Singularity, Superintelligence, Convergent Technologies, Cosmocentrism, Human and Universe*

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## 1. Introduction

Intelligence organizes the world by organizing itself.  
J. Piaget

Technological singularity is defined as a certain moment or stage in the development of mankind, when scientific and technological progress will become so fast and complex that it will be unpredictable. The term is borrowed from mathematics and is widely used to refer to such a future when the superintelligence will be realized, self-reproducing machines are created, and human beings will be integrated with this super-technological environment.

The concept of superintelligence includes two meanings: a) artificial (machine) intelligence is better than the human in certain skills, operations and skills; b) the ability of recursive self-improvement.

The author of the concept of technological singularity writes: *“According to the law of accelerating returns, by the end of this century we will be able to create computation at the limits of what is possible, based on the laws of physics as applied to computation We call matter and energy organized in this way “computronium”*” (Kurzweil, 2015). According to Kurzweil (2015), the ordinary human intellect will be many times surpassed by this artificial (machine) intelligence – “computronium”. This will lead to an “explosion of reason” and explosive acceleration of scientific and technological progress, as a result of which a new objective reality, a new socio-historical practice will reign. As the product of the cognizing subject (person), the “computronium” is “the developer of being, which enhances the creative energy of being” (Berdyayev, 1989).

Should thinking people be afraid of the prospect of singularity, or should they welcome it? What kind of world will come if the singularity hypothesis is implemented? What will the cognizing super-subject, combining all human and machine knowledge? What worldview issues the technological singularity promises to shed new light on?

The supposed high degree of integration of technological processes is very likely to have an impact on the worldview preferences of the emerging supersubject. This requires clarifying the nature of this transforming subjectivity in the process of moving to a new technological order and reasonable assumptions about these worldview preferences.

At present, such worldview systems as transhumanism, posthumanism, extropianism, technogaianism, immortalism are closely related to the concept of technological singularity. It is quite possible to add the philosophy of natural-science cosmism, which considers the transforming activity of mankind as a cosmic (primarily planetary) force that plays a significant role in the transformation of the

universe, into conceptual bases of these worldview systems. The noospheric thought of cosmists proves to be close in spirit to the concept of technological singularity.

The optimism of the cosmists about the creative activity of man is inextricably linked with epistemological optimism, which recognizes the cognition and transformation of the world as fundamentally possible. At the same time, there is a perception of new challenges facing humanity as serious threats to humanity itself, and the image of a new society as a society of technocratic dictatorship. It is assumed that it is system-noospheric thinking, based on certain general mutually agreed principles, that will effectively counter these challenges.

The heuristic sense of technological singularity is that it initiates a philosophical rethinking and research of such fundamental problems of science as, for example, the prospects of the noosphere and sustainable development of the world, the co-evolution of man and machine, the essence of man and his role in the creative evolution of the universe, etc.

## **2. Literature Review**

One of the most famous authors of the concept of technological singularity is Kurzweil (2005; 2015). In his view, the technological singularity looks like a real technotopia with the integration of downloadable consciousnesses into a single computing universe. Kurzweil (2005; 2015) believes that the state of technological singularity is achievable by 2045. *“As the most important phenomenon in the universe, intelligence is capable of transcending natural limitations, and of transforming the world in its own image. In human hands, our intelligence has enabled us to overcome the restrictions of our biological heritage and to change ourselves in the process. We are the only species that does this”* (Kurzweil, 2015).

Bostrom (2014) is also the theorist of singularity. He optimistically describes the possibility of moving to such a future stage, pointing to the probable changes in the very ontology: “just as we have abandoned ontological categories that were taken for granted by scientists in previous ages (e.g. "phlogiston", "élan vital", and "absolute simultaneity"), so a superintelligent AI might discover that some of our current categories are predicated on fundamental misconceptions. The goal system of an AI undergoing an ontological crisis needs to be resilient enough that the "spirit" of its original goal content is carried over, charitably transposed into the new key” (Bostrom, 2014).

Budanov (2014) writes about the need to synthesize ontologies of the state and ontologies of processes for an adequate understanding of the development of the “noospheric information potential” and about “the connectivity of the noosphere of mankind as a quantum supercomputer, where elementary qubits are replaced by individual consciousnesses. In this case, artificial intelligence should be finally associated with such a quantum supercomputer” (Budanov, 2014).

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Dubrovsky writes: “Numerous studies and mathematical models convincingly show that by the middle of the century our civilization will enter the phase of polyfuration, will approach a singular boundary, beyond which there is either the degradation and death of mankind, an anthropological catastrophe, or a qualitatively new stage of social self-organization” (Dubrovsky, 2014).

Nazaretyan (2014) considers preservation of the techno-humanitarian balance in the perspective of technological singularity possible.

In the book of Dyomin (2014), Russian cosmism is studied in the perspective of transhumanism. Investigating this issue Eugene Clay (2011) also draws attention to the proximity of the ideas of the religious direction of Russian cosmism to the ideas of Anglo-American transhumanism.

Pessimism about the singularitarian scenarios, as a rule, has a religious-anthropological character. In his critical work, advocating “for philosophical anthropology, against informationalism and the transhuman paradigm”, Kutyryov calls to “unite with religion against the freedom of external scientific and technical reason” (Kutyryov, 2010).

In philosophy appealing to the Christian religion, there is a significant number of skeptics about the concept of technological singularity, a strong version of artificial intelligence (AI), transhumanism and posthumanism (Chetverikova, 2015), which is mainly caused by specific soteriology, established tradition of protection and “saving the human dimension”. However, among the adepts of Christianity there are supporters of the superintelligence and even the idea of “the conversion of robots into the Christian religion”. It is known, for example, such a statement by one presbyterian pastor: “I don't see Christ's redemption limited to human beings” (Benek, 2015).

One of the arguments in favor of a strong version of artificial intelligence according to Sotnik is “the consistency of AI and the Bible... "And the Lord created man in his image and likeness..". Relying on these words, we can conclude that since the Lord first created us, and secondly, we are inherently similar to him, then we can create someone in the image and likeness of man” (Sotnik, 2016).

According to Merkulov, even Leonardo da Vinci “apparently identified the forces acting inside God-created living organisms with the forces acting in the mechanisms created by human "art", thereby equating man's creations to divine creations” (Merkulov, 2003).

This flexibility of the worldview positions of “religious singularitarianism” and its theoretical predecessors is another, after the recognition of the theory of evolution, evidence of the adaptability of religion to changing external circumstances. The

creation of a human intelligence comparable to that of humans in such a reception does not seem to be an *experimentum crucis*.

Adler, however, claims: “*We know that the AI machine is a purely material contraption. No immaterial factor enters into its construction. Hence, if it should demonstrate its ability to do everything the human mind can do, we would be compelled to conclude that the brain and nervous system with no immaterial factor added is not only necessary but also sufficient for all our mental activities, including the highest reaches of conceptual thought. That conclusion would carry with it the additional conclusion that the difference in kind between human beings and other animals is only superficial, not radical*” (Adler, 1990).

However, it is very likely that if the condition of creating a strong AI is a significant transformation of the whole society in which the active construction of reality will become an integral attribute of this stage itself, then a positive solution to the AI problem will not be perceived painfully, as something encroaching upon the uniqueness of man. And at a new stage of development, as it has often happened in history, another real subject will make predictions (Shekhovtsov *et al.*, 2017).

As for the functional surrogates of human subjectivity, alienated forms of human existence have already been noted in the social history – as an “economic machine” opposed to man. “The trouble is that this machine has existed for a long time, it does not need to be invented and built. It has long pursued its own goals, has long been turned into an end in itself, and it considers a person as a means and raw material of its own self-improvement. Moreover, it has long learned to use the man with his brain as his own “partial” detail, and learned to suppress his will and oppress his mind” (Arsenyev *et al.*, 1966). The construction of this unfortunately not a fantastic machine, as the authors rightly note, has long been cognized in detail and described in K. Marx’s “Capital”.

And it is not only the social sphere, where it is possible to find precursors of the coming technological singularity; although they should be the basis of the argument in favor of this new stage, but they can also undermine the foundation of this idea, which is vulnerable precisely because it requires predicting such a future state of society, which, by very definition of the technological singularity, should not be predictable.

Will the development of new scales of automation and the design practice of biotechnological nanoworld create a *real* technological singularity? Biologist Myers writes: “Nanotech is overhyped, though. They seem to be aspiring to build little machines that do exactly what bacteria and viruses do right now ... and don’t seem to appreciate the compromises and restrictions that are a natural consequence of multifunctional systems. I also don’t believe in the gray goo nightmare scenario: we’re already surrounded by a cloud of miniscule replicating machines that want to break our bodies down into their constituent molecules. We seem to cope, usually.

I think we will develop amazing new technologies, and they will affect human evolution, but it will be nothing like what Kurzweil imagines. We have already experienced a "singularity" – the combination of agriculture, urbanization, and literacy transformed our species, but did not result in a speciation event, nor did it have quite the abrupt change an Iron Age Kurzweil might have predicted" (Myers, 2009).

Korotaev (2009) also points out that the technological singularity is rather a "phase transition", that it is more appropriate to speak not of a "singular point" but of a "singularity zone". This formulation of the question makes the technological singularity little different from ordinary cognitive evolution, the development of science, art and morality.

Professor of cognitive robotics Shanahan (2015) pays attention to the question of the morality of the superintelligence, the outline of which was previously only in the famous laws of robotics of Isaac Asimov. "If we could avoid the associated existential risk, then the prospect of machine superintelligence would present us with an unprecedented existential opportunity, the opportunity to shape the future of humanity, the future of life, even the future of intelligence in this corner of the cosmos. So we should think very carefully about the values we want to instill in a human-level AI. What matters most to us? Is it compassion toward all sentient beings. Is it human freedom, or human progress? Is it the preservation of life on Earth? Is it some combination of these, or something whose essence we have yet to grasp?" (Shanahan, 2015).

### **3. Research Methods**

The research goal is to determine the basic general philosophical contours of the coming technological singularity.

The objectives are: (a) to formulate a general ontological principle of reception of a probable technological singularity; (b) to discover the epistemological consequences resulting from this ontology; (c) to determine the moral intentions of the future superintelligent reality.

The research methods are the integrating, the dialectical and the system approach. Since the process of movement towards a new technological order is accompanied by the development of a post-nonclassical type of rationality, it is required to elaborate philosophical conceptions that can effectively take into account the value-and-purpose and communicative components of this process. The selection criteria here are: a) a general attitude toward the recognition of objective reality; b) the heuristic character of interaction with competing ontologies and epistemic practices; c) the conception of conditional reflection; d) the cognitive-evolutionary approach. The conception of conditional reflection is characterized by an orientation toward the classical philosophical tradition of recognizing objective reality and an adequate

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assessment of the growing role of convention and representation in the development of cognition, the heuristic role of sign-symbolic systems and models. The cognitive-evolutionary approach presupposes the synthesis of theoretical-evolutionary maxims and computer metaphors. This is a cautious methodological position, suggesting various options for choosing the subject of philosophy, setting and solving its main question.

Ontological substantialism, the concept of conditional reflection and the cognitive-evolutionary approach, being integrated, can together become the basis of both the theory of ecological ethics transcending the consequentialist ethics, and the theory of sustainable development that goes beyond the framework of political ecology. The methodological basis of this study is the interpretation of sustainable development as an indefinitely long (in the long term - infinite) being of mankind in harmonic unity with the surrounding (planetary-cosmic) environment.

#### **4. Results and Discussion**

According to Kurzweil (2015), the first who used the term “singularity” for describing the technological progress of mankind was John von Neumann in the early 1950s: *“the ever accelerating progress of technology and changes in the mode of human life give the appearance of approaching some essential singularity in the history of the race beyond which human affairs, as we know them, could not continue”* (Kurzweil, 2015).

The widespread attitude to the superintelligence as “yet another technology” does not take into account the creative-emergent character of the superintelligence and thus frees people from the need to prepare for a radical transformation of all social institutions and social relations associated with the emergence of this superintelligence. Social institutions in their present form outside the technological singularity are unlikely to survive, and the dominant religious worldview values will be superseded and replaced by cosmocentric and scientific-realistic notions of the dialectical unity of matter and consciousness. Our understanding of what consciousness is and what it means to be a human will change, not as a result of humanitarian discourse, but due to objective circumstances generated by technological singularity. In turn, the latter, probably, will be coordinated with transhumanist perspectives of development of convergent technologies.

It is possible to formulate three interconnected key ideas about the adequate reception of the technological singularity and the probable character of the worldview attitudes of the corresponding social consciousness: it is ontological substantialism, epistemological optimism and ethical rationalism. In this case, the study of a new subject-object environment will require correction of existing epistemological preferences and conventional adoption of some new ontological assumptions. Some assertions of digital physics, enactivism, radical constructivism, ecological epistemology and universal evolutionism are of particular interest in this

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respect. However, the most important is the choice of the very subject of philosophy, which, it seems to us, should not be limited only to thinking (as it was in neo-Kantianism, positivism and so-called “gnosiological” trend of Soviet philosophy). The exclusion of nature from the subject of philosophy, which prevents the full development of substantial, dialectical logic, was criticized by the well-known ecomarxist J. B. Foster in his fundamental work “Marx’s ecology: materialism and nature” (Foster, 2000).

Regardless of the options for solving the basic question of philosophy, its formulation, in our opinion, can not be separated from the problems of the unity and diversity of the world, determinism and dialectics. An adequate central category of the ontology of technological singularity should be the category developed at the intersection of these philosophical problems. This is a *substance* – most suitable category for characterizing an objective reality that does not cease to exist outside the computational continuum, which has the chance to be called a technological singularity.

As the influence of this continuum on objective reality will be strengthened in accordance with the increasing computational possibilities, the conventionality of reflection of objective reality in this continuum will also increase. In the future integral noospheric thinking, which is not lost in a series of endless qualitatively different cause-effect relationships, but relies on the category of substance, it is quite organic to adopt such an element of the heritage of classical philosophy as the *theory of reflection*. After all, the “Doctrine of the Essence” in Hegel’s system (Hegel, 1813) begins precisely with the category of reflection (Reflexion). The conception of the nonlinearity and multifactoriness of cognitive evolution towards a probable technological singularity may be associated with the category of interaction (Wechselwirkung) that concludes this part of the “Science of Logic”, which has an inner kinship with the category of reflection that can not be reduced to a mere copying of reality, but is representation of the latter (Tutubalin, 2009).

Reflection is an attribute of matter and as such is the fundament of subjectivity evolving towards self-transcendence. The increasing importance of the subjective factor, the activity of the subject of cognition and the subject of the historical process, although it does not mean the substantial or attributive character of subjective reality, inspires optimism about the ascension of the human spirit and the possibilities of cognition of the universe (Mantatov, 1980).

As an alternative ontological foundation of technological singularity, one can point out the ideas of pancomputationalism, digital philosophy (Zuse, 1969) and digital physics (Fredkin, 2003). In these conceptions, close to the ideas of Spinoza and Hegel, computation is itself an attribute of the universe. But the rooting of the thought in the foundation of matter and the perception of subjectivity as an irremovable, always preceding objective external world or always accompanying reality, may be the cause of the devaluation of the unique human dimension.



And can other, non-human forms of subjectivity (agents of the actor-network universum, for example), irreversibly eliminate the human mode of being on the approaches to technological singularity, and lead the latter into an evolutionary impasse? Mankind has already faced a false consciousness – as the guiding force of the transmuted forms of collective subjectness. Will some illusions about technological singularity lead to the terrible “victories” of technocratic “social machines” even before the machine of global superintelligence enters the arena of history; will the “deterritorialized zone of freedom” turn into a machine of oppression? As A. P. Nazaretyan writes “in the popular and scientific literature, widespread reasoning on the destructive hostility of "artificial intelligence" to its creator is dichotomized by two categorical pairs: "artificial – natural" and "intellect – morality”, but “the rationalists of antiquity (Socrates, Confucius) argued that intellect and morality are not such entities that are external to each other” (Nazaretyan, 2014).

It seems that an integral, system-dialectical worldview, based on ontological substantialism, epistemological optimism, representational versions of the theory of reflection, should include ethical rationalism. In the axiology of the coming technological singularity, the dominance of the aletic modality seems likely to increase, as all the aspects of transforming subjectivity become rationalized and technologically advanced. Such dominance, however, does not mean the elimination of the existential-anthropological aspect of subjectivity, which also proliferates into the sphere of inhuman actants and creates new forms of conventions. Different approaches can be applied in the study of these forms: from the Marxian conception of the inorganic human body to the conceptions of habitus, cultural genes, sociocodes, the memetics, the theory of nonlinear evolution, and the actor-network theory. In the case of their consistent interaction with the above-mentioned basic worldviews, some of these conceptions can become effective tools for an interdisciplinary study of the conditions of possibility and the prerequisites for the formation of a technological singularity.

Technological singularity is an issue of the future. The question is: why do we need this knowledge of the future? Our answer is this: to determine the prospects for sustainable development of mankind. Technological singularity is a dialectically contradictory phenomenon. It generates both new existential possibilities and new existential risks for mankind. One of the main problems of the conception of technological singularity: how to survive in a new transhumanistic era? The solution of this task is also the main objective of the conception of sustainable development – the agenda for the 21<sup>st</sup> century.

One of the main issues of sustainable development arising in connection with the technological singularity is the dilemma: to allow or to prevent the creation of machine superintelligence? It is known that the boundaries of the stability of a living system are at the same time the boundaries of its cognition. Sustainable development is an acceptable development, and the process of cognition is a process of describing

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and justifying the domain of permissible changes of the system in the process of its interaction with the environment. The creation of a machine superintelligence depends on the production of new knowledge about man and nature. And in turn, the superintelligence will greatly expand the emergent-creative possibilities of man and, accordingly, the limits of sustainable development of human society.

Science fictionists discuss what will be the end of human history, what the posthuman epoch will be, but they underestimate the power of “thinking humanity”, as if the appearance of this phenomenon was not a natural result of the creative evolution of the universe (Engels, 1975); they also do not take into account the “cunning of the human reason” (Hegel, 1970), capable of using some extra intelligence for its own amplification. We create a machine superintelligence in order to expand the existential possibilities of man. If we obtain the technical means of unlimited expansion of consciousness, enhancement of cognitive possibilities and bodily parameters of a person, then there is nothing that could hinder the unlimited sustainable development of mankind.

The positive sense, according to which the technological singularity can become a new existential opportunity, can be grasped and understood only by going beyond the anthropocentric point of view and adopting a cosmocentric perspective. Perhaps modern philosophical discourse will have to go a long way to adopt a cosmocentric view of the world. Unfortunately, at the present time the philosophy of radical constructivism, according to which the vision of the world remains inevitably human, is still widespread (Tsokolov, 2000). Such a solipsist point of view seems “delightful” in its simplicity and narrow-mindedness. The epistemological imperative of the cosmocentric approach to the world is to go beyond human solipsism and try to understand the immanent ontology of the universe and the cosmic essence of human consciousness. In this sense, the imperative of cosmocentrism coincides with the purpose of the “computronium” (superintelligence) – “waking up the universe, and then intelligently deciding its fate by infusing it with our human intelligence in its nonbiological form” (Kurzweil, 2015). R. Kurzweil also writes: “Over time we will convert much of the mass and energy in our tiny corner of the galaxy that is suitable for this purpose to computronium. Then, to keep the law of accelerating returns going, we will need to spread out to the rest of the galaxy and universe” (Kurzweil, 2015). Let’s add: the great dream of the great thinker Tsiolkovsky (1926) about the development and humanization of the cosmos will come true.

## **5. Conclusion**

The development of modern convergent technologies opens the prospect of a new technological order. Its image as a “technological singularity”, i.e. such “transhuman” stage of scientific and technical progress, on which the superintelligence will be practically implemented, seems to be quite realistic. The determination of the basic philosophical coordinates of this future reality in the

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movement along the path of sustainable development of mankind is the most important task of modern science.

The technological singularity in the form of a “computronium” (superintelligence) opens up broad prospects for the sustainable development of mankind in the cosmic dimension. This superintelligence will become an ally and conductor of man in the process of cosmic evolution.

Technological revolutions are changing the human body and intelligence. And although technology is always a challenge and a threat, the salvation of humanity can be achieved exactly where the threat comes from. Coping with future challenges, human-machine civilization will generate new ones over and over again, progressing in an exponential manner. But our confidence in the natural light of rationality must never leave us. Is the emergence of superintelligence inevitable in the Universe? This question is very close to one of the key questions of philosophy: is rationality itself inevitable in the world? And the superintelligence can probably help humankind answer even that question.

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