Metamorphosis of Society: The Potential Impact of Cyborgian Technologies on Social Relations

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Abstract

The article is a study of potential scenarios of the influence of cyborgian technologies on social relations and social structure of the future society. The authors forecast several scenarios of social development under the conditions of cyborgization development, i.e. mass introduction of technological modifications of human corporeality and cognitive system. For this purpose, they analyze possible variants of creating new social hierarchies in the conditions of technological human enhancement. The paper pays special attention to the problem of society fragmentation and possible conflicts as a result of uneven distribution of technologies. Paying attention to “futuroshock” - possible social reaction to radical technological transformations, the authors propose the development of ethical principles and the development of technological empathy to achieve and maintain consensus in the society of the future as strategic directions aimed at adapting society to new conditions.

Keywords: cyborgization, social transformation, technological modification, futuroshock, social stratification, technological empathy, posthumanism, identity, social fragmentation, neurointerfaces, biotechnology, social adaptation

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43 We live in an era of constant and rapid technological progress, where projects that seemed like science fiction in the recent past are becoming reality. Specifically, cyborg technologies, which are currently in the early stages of implementation, could significantly impact what we fundamentally consider as “human,” potentially transforming both physical and cognitive aspects of human nature.

44 For millennia, human nature has remained relatively constant; however, the potential emergence of new hybrid forms of existence may soon challenge this constancy. Such metamorphoses, if they indeed occur, will influence not only the physical, bodily component of human existence but will fundamentally change the deep foundations and very identity of human beings, which will undoubtedly require a qualitative reconsideration of all key philosophical categories. The authors have chosen the foresight genre for this publication to envision and predict potential scenarios for the development of this emerging sphere.

45 Within this thought experiment, the authors, guided by possible future scenarios presented in scientific literature and popular culture, will analyze key trends and factors that could influence social relations in the coming years and decades. Methodologically, the authors integrate personal reflection with an analysis of existing literature to forecast possible future events. This approach was chosen because the authors, through individual and joint research, have deeply immersed themselves in the studied field, analyzed the issues, and through personal reflection and scientific intuition, consider several alternative development scenarios. All this is done to identify possible key factors that will most significantly influence the metamorphoses of social life in connection with the spread of cyborg technologies.

46 Theoretically, the work is largely based on Manuel Castells' research, who, as the author of "The Information Society: Economy, Society and Culture," laid a fundamentally important foundation for studying how social reality changes under the influence of information technologies [5]. Drawing on Castells' work, we can explore the ontological impact of cyborgization. New forms of existence may emerge as humans transform into biotechnological hybrids, merging with technology and moving beyond purely biological forms.

47 Additionally, we can try to predict how social structures change in the context of cyborgization influencing the formation of typologically new social connections, thus acting as a social phenomenon. At the intersection of these two foundations, a new identity emerges, based not only on biological components but also technological ones, or possibly their merger in various proportions. Such qualitative shifts will inevitably have social consequences, meaning both the nature of social interactions and the social

organization of society may begin to take new forms. Furthermore, it's important to note that under such conditions, communities will form differently (both in structure and purpose), potentially acquiring a hybrid nature and developing within new norms where technological enhancements become a kind of benchmark for participants.

48 Certainly, this will involve systems of power and control, including social institutions, educational and medical practices, and entirely new forms of social control may emerge. Cultural transformations are exemplified by several artists and cultural figures who promote novel concepts of physicality and identity, utilizing innovative forms of artistic expression. One of them, the artist Stelarc, will be discussed further. A central theme in the developments described is the blurring of boundaries between the natural and the artificial.

49 Let's begin by analyzing the most obvious category – human physicality. The human body, in various interpretations throughout history, was initially considered inviolable to certain manipulations depending on the culture and historical period - meaning there was always a line that was impermissible to cross. For example, in Christian tradition, the human body served as an image of God's likeness, and noting such a high purpose, the Apostle Paul called the human body God's temple: "...your bodies are temples of the Holy Spirit who lives in you..." [2]. A completely different approach, based on other foundations, also included requirements for bodily inviolability - in particular, John Locke wrote that "...every person has property rights over their own person...", clearly implying that a person's body belongs to its owner, who lives their life in a "natural" way [7]. The list of examples confirming that historically the human body was hardly perceived as something plastic and subject to modification could go on.

50 However, by now, the human body has begun to transform into a field for technological experiments and modifications. Such experiments are conducted on physicality from several angles and include various technologies. First, there are implants (artificial devices or materials that are embedded in the human body) [6], neural interfaces should be noted separately (systems that allow direct interaction between the human brain and artificial devices), and at almost the opposite end of the spectrum are genetic modifications, meaning changes to human genetic material through selection, genetic engineering, and other methods [9]. These technologies, which already exist, don’t just blur the line between humans and technology, but force us to look at humans themselves from a new angle, creating the need to determine where the natural human ends and their technologically enhanced version begins, and what to do in such new conditions from the perspective of philosophy, politics, law, etc.

51 Moreover, the ongoing transformations are not limited to just the physical level: the same neural interfaces have prospects for qualitatively changing human cognitive abilities. In this regard, new forms of consciousness may emerge, significantly expanded models of sensory perception and other new capabilities, which draws attention to the prospect that even "natural," "normal" or "traditional" human thinking (we put these definitions in quotation marks to emphasize the possible pluralism of corresponding categories soon) will cease to be the only possibility.

52 V.A. Emelin described technologies as a factor in transforming human identity back in 2016 and, speaking about the transformation of higher mental functions resulting from technological expansion, noted the emergence of Homo Technologicus and the need to study changing human identity [4]. This potential transition from Homo Sapiens to Homo Technologicus could represent a new stage of evolution, warranting further exploration. Note that we state this postulate not to indicate that humanity is developing, speaking of another stage of its development, but to indicate the quality of change. Even the thought of such a possibility confirms that a qualitative leap is now occurring, which in its scale is comparable to or even exceeds the significance of human speech emergence and the invention of writing.

53 It's important here that the potential Homo Technologicus would integrate technologies into their own being, making them an integral part of themselves. This is entirely different from being an advanced user of advanced technologies, using them as desired, necessary, needed tools, but still, the rejection of which would not mean the disintegration of the entire essence of the "human," the collapse of personality, and the cessation of capable, or better said, conscious and meaningful existence.

54 Therefore, questions that are now being considered within professional philosophical discourse become relevant. It is noteworthy that ethical issues are often studied separately, which may limit interdisciplinary understanding. There are many philosophical questions: these include the boundary problems, moreover boundaries between multidimensional spaces, which are themselves a problem in terms of how to define and evaluate them in conditions where human consciousness risks being distributed between biological and technological foundations; and personal autonomy becomes problematized because of human-machine integration.

55 Regarding the statement that philosophical and ethical issues are often studied separately today, with these discourse directions rarely intersecting, since the questions mentioned above are now refracted within philosophical, political science, and socio-economic discourses, this is easily explained: besides the philosophical, deep component, the ongoing processes relate to practical life and can influence practical aspects of human existence and obvious categories of social life.

56 Cyborgization directly interacts with social systems. Therefore, we would like to present a scenario where existing social hierarchies fundamentally change due to the development of cyborg technologies. This scenario likely involves the formation of new elites and marginal groups, membership in which will be determined by access to, desires for, and requirements of technological modification. We can assume that existing inequality won't be overcome, but additional forms of social stratification will emerge alongside or on top of it, and society will acquire new dimensions, and its structure will change through this “expansion,” so to speak.

57 Thus, entirely different elites may emerge, whose typology we will try to predict. Before listing possible variants of such segmentation, let's explain that their definition is based on the hypothesis that the very concept of social capital - or more precisely, what will constitute it - may fundamentally change. Besides traditional economic and cultural components, social capital may include and even be dominated

by a technological component (in terms of practical human enhancement through technology).

58 In such development, first and foremost, a technocratic elite will emerge - a group of people who will have access to the most advanced implants and other cyborg technologies and, moreover, will be able to use these systems both individually and in collaboration with other group members. It's logical to assume that this group's representatives will occupy leading positions in politics, economics, and science, as they will possess unmatched abilities in information processing and decision-making, thus potentially becoming an administrative elite defined through technological modification.

59 Alongside this, if we continue examining prospects through the lens of social hierarchies, we can predict the emergence of superhumans – the development and embodiment of that post-humanist perspective where, through various technologies or possibly a whole complex of them, human cyborgization will lead to people transcending their limits and becoming something new and "other," radically different from the "traditional" human. We can provisionally call this the superhuman perspective, and importantly, these individuals will possess such enhanced physical and mental capabilities that they can no longer be classified as Homo sapiens. The potential for discrimination against traditional humans here is so significant that it would require separate research.

60 Additionally, there may remain, or rather emerge, a class of "pure humans" - those who, for whatever reasons, don't undergo cyborgization. While it might sound strange or even illogical, such a group in a world where the technosphere dominates would become a minority, or its members might become truly unique. This scenario is depicted in the film "Immortal (Ad Vitam)," directed by renowned artist and comics author Enki Bilal. In this cult film, which blends cyberpunk (representing cultural decline through massive technological progress) with biopunk (showing such extensive use of genetic engineering and other biotechnologies), traditional humans have practically ceased to exist. Earth is populated by mutants, cyborgs, and genetically modified characters who are either artificially grown or at least contain numerous artificial organs. Finding a biologically "standard" human in the film's plot becomes an almost impossible task, even for a deity seeking a physical vessel for incarnation.

61 If we imagine such a perspective as a genuinely possible scenario, it's difficult to say what status such a group would hold. On one hand, they could become a spiritual elite, or better said, a group with sacred status – people who symbolize the preservation of true human nature. On the other hand, they might become a marginalized community or stigmatized individuals, depending on how the system of social norms and values would be structured in such a world.

62 Speaking of marginal groups, we can assume that in a cyborgized society, this position would be occupied by those who consciously refuse cyborgization based on political, ideological, or religious grounds. Such segments might demand reservations for themselves to continue living as they prefer, or they might be pushed into such spaces as carriers of "impurity" - in other words, embodying what the modified majority would prefer not to encounter. Representatives of these groups may adopt Luddite

positions and resist technological changes, thus creating new forms of protest and resistance.

63 Another marginalized segment could consist of the "technologically disadvantaged" - those who would remain in a traditional state not by choice or personal conviction, but because they lack access to human enhancement technologies. It's worth noting that the risk of a digital divide, at least at the international relations level, is a serious factor considered among the most dangerous threats to the inclusive development of the global community. It's logical to assume that technological inequality within individual societies could become a real problem and thus constitute one of the main social challenges in the future. Within this group, a hierarchy may develop depending on the extent of access to the technologies described above, meaning that social inequality issues could multiply like fractals.

64 It's worth noting separately that the above scenario, even considering the uncertainty and/or diversity of cyborgization formats and scales, could likely contribute to the formation of various hybrid subcultures that would radically experiment with cyborg technologies. Such images are already frequently described in cyberpunk literature; particularly in William Gibson's "Johnny Mnemonic," which presents a whole group of such people who have found their niche in a technology-filled city and physically exist within it yet remain isolated from social life and are connected only within their community.

65 And of course, we can already see examples of such images in contemporary art through new cultural and artistic forms. One of the artists promoting these ideas is Stelarc, who since the 1980s has been presenting radical performances based on experiments with modifications to his own body [12]. Over these years, he has conducted many experiments with prosthetics, implants, exoskeletons, and continues to develop ideas using increasingly sophisticated cyborgization technologies in his art. One of this article's authors interviewed the artist in 2024 and is currently preparing a separate academic publication about his work through the lens of cyborgization. In the interview, Stelarc said he views the human body as a model that can be improved, and technologies are his tools for exploring and transcending boundaries and creating possibilities for expanding human capabilities. In this sense, Stelarc can somewhat serve as an ideologist for a certain subculture, like those we described, whose goal is to create a future where technologies will be used to improve various aspects of human nature.

66 Mass culture and art often predict social processes through scenarios that might appear excessive or utopian. History shows that even the most fantastical plots can materialize in surprisingly similar forms. Therefore, examining the artistic forms described above, we can reasonably assume that in a possible future world where society is divided by cognitive and physical capabilities, social systems based on the level of technological integration of their participants may be structured quite differently than we anticipate.

67 Probably, considering the further development of cyborg technologies and their growing role in social life, there will be a need to revise the social contract, which in this case we mean as socially accepted and agreed-upon rules regarding people's rights, obligations, and expectations in society and in interaction with the state. It's important to

think about these issues today to consider new contours of social stability and legitimacy in the context of ongoing technological changes.

68 Next, we examine potential changes in the economy and labor relations. In recent decades, the topic of significant labor market changes has become quite popular. We see that some professions are losing relevance while new ones appear, not necessarily mediated by the need to become strictly technical specialists, but at least related to technologically driven changes in social life. For example, digital transformation strategies in many countries, including Germany, suggest reducing the share of manufacturing in the economy and replacing it not only with technological sectors but also with services [11]. Many such examples could be cited, but we'll limit ourselves to the above to show that because of such development trends, "artificial workers" may appear (and are already appearing), and in the future, competition for jobs will unfold between humans and AI-based digital products, and in the more distant future, will include cyborgs as well. As a result, the prospect of hybrid forms of labor that would combine human experience and technological capabilities appears quite realistic.

69 In October 2024, a round table on "Artificial Intelligence and Diplomacy" was held at the International Interdisciplinary Conference "Philosophy of Artificial Intelligence - Artificial Intelligence and Consciousness", organized by the Russian Academy of Sciences and the Scientific Council under the Presidium of the Russian Academy of Sciences on the Methodology of AI and Cognitive Research [3]. Several speakers representing various fields of knowledge drew attention to the fact that actively developing generative artificial intelligence is indeed capable of replacing many human functions, but at the same time, as was emphasized, there will always be a need for management and operation of these technologies by experts who, firstly, have the required professional competencies to exclude errors and distortions, and secondly, are able to bear responsibility for the decisions made. This can be perceived as a directly hybrid labor function, combining both the operation of technologies and their use and management with the help of intuition and expertise of a human specialist.

70 Given these predictions and prospects, we should consider society's potential reaction to new conditions if even some of these predictions come true. Here, it's appropriate to reference Alvin Toffler's concept of “future shock” [8]. Toffler describes society's state under excessively rapid and massive social and technological transformations, which can be summarized as a complex of stress and disorientation. Half a century ago, Toffler noted that the pace of change was growing exponentially, along with information volume, making it impossible to accept, comprehend, and absorb everything. This near real-time acceleration is accompanied by changes in traditional institutions and socio-humanitarian values, followed by (or simultaneously occurring with) changes in human lifestyle, which inevitably impacts one's identity and self-perception. The phenomenon of future shock is notable for affecting both human psychology and social organization of society. In our work, it's important to note that such radical transformations may result in existential crisis and cognitive dissonance. In conditions where it becomes paradoxically natural for humans to integrate technology into their own body and consciousness, the question "What does it mean to be human in such a world?" transforms from purely philosophical and abstract to urgently practical.

71 Therefore, we suggest that such development may be accompanied by the following social factors that need careful consideration: First, individuals may experience significant alienation both in a social sense and in relation to their own essence. In the first case, a person may reject or be unable to integrate technologies into their nature and, as mentioned above, end up on the sidelines of life. In the second case, if a person is forced to become a cyborg to maintain employment, get promoted, perform new functions - that is, to remain competitive in the labor market, they may experience internal conflict and rejection of their artificial components.

72 Another problematic perspective is the concept of potential immortality, which Yuval Harari suggests may become technically feasible through advanced biomedical interventions (through virtually unlimited life extension via organ and tissue replacement - naturally, such procedures would only be available to society's elite) [10]. From their respective positions, transhumanists and posthumanists believe this perspective offers exceptional opportunities for the transhumanistic "superhuman" and post-human, although these opportunities should differ.

73 But what's important for us to note now is that even if we consider the possibility of extending life by centuries (that is, by dozens of decades), let alone longer periods, and taking into account how “traditional” humans evaluate the timespan of human existence, this new perspective will fundamentally force us to reconsider the meaning of life, life strategies, and the concept of development. This is because, whether consciously or implicitly, we currently view human existence through the lens of finitude within a very limited timeframe.

74 The next category that deserves attention, which we have already noted several times, is the so-called social fragmentation. Within this framework, different groups of both cyborgized individuals and unmodified humans may begin to identify themselves so differently that they either lose common ground for interaction, or this becomes the basis for conflicts, if only because each such group will have its own unique value system and worldview. Thus, we can suggest that radical technological and social transformations associated with the concept of future shock may lead to serious psychological, existential, and social consequences.

75 Following this excursion into possible perspectives regarding the influence of cyborg technologies on social relations and societal structure, we will propose several strategic directions that could allow for productive adaptation to these anticipated changes. First, let us note an area that is currently being actively researched and promoted in various spheres related to the digitalization of social life – this is the formation and implementation of ethical principles in human worldview that would not only allow us to evaluate the problems of artificial intelligence or digitalization of social life but would also directly relate to cyborgization.

76 Undoubtedly, such principles must clearly establish a position that would recognize both an individual's freedom of choice regarding technological modifications and protect the values of social coexistence while upholding the idea of equality. This task appears very challenging, as it requires finding a balance between the demands of technological progress and the need to protect fundamental human values. We have previously written that a positive outcome is impossible without forming and developing

interdisciplinary dialogue between representatives of various sectors of society – between politicians, scientists, practitioners, and representatives of different interest groups.

77 In this context, we must add that we consider it important in the conditions of cyborgization – a state unprecedented in history – to coordinate the acceptance of possibilities and prepare for potential experiments and testing of new forms of governance and social organization. In practice, formats of so-called “regulatory sandboxes” are already being discussed and even implemented, within which testing of innovative technology products, such as autonomous vehicles, is allowed in specific territories [1]. Such a configuration could become promising for testing other innovative management projects in a hybrid society.

78 Another promising area, which lies at the intersection of psychology and management, is the concept of technological empathy and its systematic development. This idea has been developing in recent years both in science and practical activities and implies the skill or ability to understand the feelings and experiences of other users (counterparts in the broadest sense) when communicating in digital networks, while also responding and reacting appropriately to their feelings and needs.

79 Technological empathy differs from traditional empathy in that it primarily involves digital interaction and can be omnichannel and seamless, using data and behavioral analytics of those with whom communication occurs as its foundation, which helps compensate for the absence of nonverbal signals and body language necessary in traditional contact. When examining this concept in the context of cyborgization, we can define technological empathy as an evolving ability to interact emotionally with biological and various hybrid beings. Technological empathy in the age of cyborgization could also be defined as hybrid in nature, integrating traditional human empathy with emotion recognition technologies.

80 The technologies described above, including neural interfaces and various implants, can enhance both the perception, analysis, and exchange of emotions. It appears that if this category considers the ethical aspect - namely, focusing on preserving humanity/human qualities while technologically enhancing emotions and feelings, and ensures a controlled balance between natural and artificial emotional intelligence - it could become a promising tool for helping society and individuals adapt to the age of cyborgization and overcome futureshock. The success of such a project would also help mitigate the existential risks associated with cyborgization.

81 At the social level, technological empathy could serve as a bridge between different social groups mentioned above, allowing individuals not only to communicate without prejudices and misunderstandings or rejection (as often happens in relation to the "Other"), but also to mutually share their own experiences of existing in a cyborg society.

82 In conclusion, it's worth noting that the ability to adapt to ongoing changes will enable humanity to manage its future. Since there are many possible scenarios for developing various models of social organization depending on the extent of technology integration into public life, human physicality, and cognitive systems, it's important to

formulate, evaluate, and try to maximize the opportunities that progress provides for human development and self-realization.

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