

CSIS 2019
**11th International Scientific and Theoretical Conference “Communicative
Strategies of Information Society”**

**THE HUMAN ENCOUNTER WITH NEW TECHNOGENIC
THREATS**

Olga D. Garanina (a)*, Tatiana V. Naumova (b)

*Corresponding author

(a) Moscow State Technical University of Civil Aviation, Kronshtadtsky blvd., 20, Moscow, 125993, Russia,
ogaran@yandex.ru

(b) Moscow State Technical University of Civil Aviation, Kronshtadtsky blvd., 20, Moscow, 125993, Russia,
t.naumova@mstuca.aero

Abstract

The paper focuses on humankind prospects of existence and development against the backdrop of uncontrolled implementation of information technologies. The essential feature of modern mass consciousness, as found in media and cognitive sources, is a computer euphoria — an unconditional belief that innovative technological means can solve all social problems. People perceive this belief and live with it in a new digital reality, assuming that informatization is the only possible way for society to develop successfully. The authors offer a systematic analysis of a person's place in the computerized world and show that the technological innovations expansion triggers new social and socio-psychological problems caused by the complex nature interaction between people and the most advanced intelligent systems. The paper reviews such problems as reliability and ergonomics, availability and safety of information technology, as well as computer competency and psychological readiness of a person. Through the lens of the phenomenological method the authors study and determine the latent bases of the negative consequences of the information technology influence on a person, paying special attention to psychological aspects. Deployment of IT threats will inevitably lead to the new scientific and technological ideas defamation and the loss of faith in technological progress. To elude this dangerous tendency, socio-humanitarian expertise is needed, which provides at the legislative level. the analysis of technical innovations' social impact and control over the new technologies implementation regarding possible risks for the physical and mental health of a person.

2357-1330 © 2020 Published by European Publisher.

Keywords: IT, IT threats, computer competence, psychological stability.



This is an Open Access article distributed under the terms of the Creative Commons Attribution-Noncommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

1.1. Information technologies as a risk factor for social development

The new round of the civilization movement deals with the information society, the technological basis of which is the means of receiving, transforming, storing and transferring information. The results of the information engineering and technology development are accompanied by euphoria in the mass consciousness, the content of which is the absolute belief that innovative technologies can solve all problems of social life. However, a philosophical analysis of the human existence prospects in the new social conditions, actively presented by Russian and Western researchers (Grebenshchikova, 2016; Felt, Schumann, Schwarz, & Strassnig, 2014; Fuller, 2009), allows us to draw a conclusion about a peculiar perversity of anthropological expectations, which is typical for any development: it is always accompanied by diseases of growth, the emergence of new risk factors that initiate negative consequences and require non-standard solutions (Shushpanova, 2018; Strand & Kaiser, 2015). The scientific community is alarmed to note the growing negative attitude towards IT innovations on the part of psychologists, medics, sociologists, teachers and other scientists, who study the effects of the new digital environment on people and state the transformation of adaptation mechanisms (Asmolov & Asmolov, 2019, Tutton, 2011). The negative potential of information technologies that a person has to embrace, is growing due to the fact that the digital world's communicative practices do not sufficiently take into account the physiological, mental and social limitations of a person who doesn't have the ability to change coherently with the changing conditions of existence in a short period of time.

2. Problem Statement

The accelerating expansion of innovative techniques and technologies leads to the emergence of new social and socio-psychological problems and sense change for some old ones, as well as to qualitative changes of the human existence. Reality is expected to be obvious, positive, and understandable. Therefore, people trust scientific discourses and assume their unconditional intention to discover possibly dangerous for life problems.

Deployment of IT threats will inevitably lead to the new scientific and technological ideas defamation and the loss of faith in technological progress. There is an increasing contradiction between the social need for innovative technological development and the growing negative potential of technological innovations, accompanied by a strengthening pessimism in the recognition of the new technology drivers. This situation implies a systematic analysis of the contradiction parties and the detection of its deployment directions.

3. Research Questions

3.1. Negative consequences of the informational technologies development as a social phenomenon

In the last third of the 20th century, cybernetics was actively discussed in philosophical literature and became a fashionable scientific trend. At that time, information trends had not yet become a daily

occurrence, but many believed that cybernetic methods and solutions would allow solving many practical issues of social development at once and without much difficulty. After time and experience have shown that cybernetic methods are not universally applicable and that their implementation requires a great deal of hard work, there came the era of disappointment and discreditation of correct, but not fully understood ideas.

Nowadays mass consciousness and science face a new wave of computer euphoria, assuming that innovative information technologies can overcome all basic social difficulties. However, given the undulating nature of any development, it can be expected that the revival and recovery, the hopes placed on new techniques and technologies, may again be followed by frustrations and depression due to the rather serious negative consequences of digitalization (Lukov, 2018; Tutton, 2011). In particular, the expanding movement of digital downshifting is a good example of these tendencies. Such negative social and psychological phenomena, caused by fashion, are subject to research in order to prevent discrediting innovative trends in science and technology. This is a social problem, which is related both to the organization of science and social institutions such as media and advertising. Setting up an institute of social expertise offered to the society of information technologies might be the solution to this problem (Aseeva & Pirozhkova, 2015; Selin et al., 2016). The social consequences of information technologies are being actively discussed at various forums, but it would be too bold to talk about the prerequisites for the institutionalization of social expertise in this area (Pirozhkova, 2018).

4. Purpose of the Study

The main purpose of the study is to elicit the reasons for the negative potential of innovative information technology growth. Decomposition of the goal was carried out in two directions:

- Detection and characterization of basic problems caused by the uncontrolled implementation of information technologies into people's everyday life;
- Analysis of the negative consequences of the innovative information technologies deployment in a living space of a person, rationale for the IT threats relevance to life and psyche of a person.

5. Research Methods

5.1. Systemic analysis of human interaction with intelligent systems

Information media is not an end in itself, but only a part of "human-machine" systems, in which people and technology participate as well. Safety of functioning and, therefore, the efficiency of such systems can be provided only by keeping to the basic system principle - the requirement of equal durability of all system elements. With that in mind, revealing and characterization of basic problems caused by the uncontrolled implementation of information technologies into people's everyday life was carried out by means of system analysis. Within the scope of the system analysis, enhanced by the transdisciplinary approach, the techno-ergonomic, cognitive, pedagogical and psychological directions of human interaction with intelligent information systems were highlighted.

5.2. Transdisciplinary approach as a methodological basis for integrating knowledge about the ways of interaction between humans and intelligent systems

As a methodological basis for the integration of different scientific knowledge areas, transdisciplinary approach combined with systematic analysis has proved the link between cognitive, pedagogical, and psychological directions and technical and ergonomic ones with the priority of technological aspect.

5.3. The phenomenological method in understanding the experience of the digital reality negative perception

Proceeding from the fact that a person expects the reality they are living in to be obvious and positive, the authors have applied a phenomenological method aimed at describing the experience of the digital world negative perception.

The phenomenological method was embodied by correlating various aspects and components of the information technologies influence on a person in order to establish their invariant semantic structure and determine the moments of negativity expected by a subject in the transforming world (Felt, Schumann, Schwarz, & Strassnig, 2014). Thus, the discrepancy between projected (imaginary) positive reality and evident negative consequences of total informatization of human life was elicited.

6. Findings

6.1. Basic problems caused by an uncontrolled implementation of information technologies in people's everyday life

1. Problem of reliability and ergonomics of information technology. Safety of functioning and, therefore, the efficiency of "human-machine" systems can be reached only in fulfilling the basic system principle - the requirement of equal durability of all system elements. This requirement accumulates a number of complex anthropological problems, among which are: ergonomic problems of providing convenience and efficiency of human work with new means that are different in essence from traditional ergonomic problems; issues of psychological compatibility of people and modern intelligent systems; problems of education and training for people, who somehow deal with means of information processing and transfer.

2. Availability problem. The intensive development of information technologies seems to be somewhat one-sided. Emphasis is placed on the development and production of a variety of technical tools, but in order for them to be useful and effective, they need to be equipped with affordable software tools and a sufficient number of media. Experts believe that working with an intelligent system should be, as expressed, intuitively understandable to a user. However, such systems in effect go very quickly unserviceable and fail to carry out the intended function. It is a technical problem, but it has a huge social impact, as the trust in innovations gets lost, the vigilant attitude to the new technics is formed.

3. Cognitive problem. A person's cognitive characteristics change proficiently in innovative technological conditions, which provide free access to any information of any volume from a variety of sources and allow them to solve educational, scientific, industrial and other problems. Firstly, under the

influence of information technologies the modern human perception gradually departs from the formal categorical thinking process (i.e., when thinking process unfolds in the categories and images within the conceptual and logical characteristics of human thinking) and gradually passes to the transpersonal one, where the human perception expands beyond the limits of the usual individual creative reflection of the world. Secondly, with the pace of life acceleration in the modern world, a person has very little time to process the huge volumes of incoming information, which leads to a deterioration of logical thinking, the onset of "information neurosis". It results in a decrease in quality of life. This problem has already been faced by psychiatrists around the world (Soldatova & Rasskazova, 2017).

4. Safety problem. Wide computerization, mass adoption of personal computers, various media gadgets put another problem on the agenda - the problem of IT security. This is not just a technical problem, but also a social one. Transition to paperless information exchange, replacement of personal and business records by PCs, development of e-mail, etc., turn every setback, every halting, not to mention a short-term failure, into a serious social problem. We should also point out a number of legal problems, such as machine documents legal force, protection of information from deliberate distortions, protection against abuses while using information technologies, protection of intellectual property, etc.

5. Computer literacy problem. The problem now seems to be losing urgency, as computer science taught in primary school provides the basis for working with intelligent systems at an early age. However, computer literacy is now needful for anyone, regardless of their specialty and occupation, and most importantly, regardless of age. This is particularly true for those social groups that limit their exposure to modern information technologies to communications only, often abandoning the possibility of working with information through these means. It should be noted that psychologists pay clearly insufficient attention to the problems associated with adult education in this area, although there are many unresolved issues here.

6.2. Negative consequences of innovative information technologies deployment in human living space, technological threats to human life and psyche

1. Defamation of a rather considerable part of the created information systems is partly caused by insufficient consideration at their designing and introduction of human (psychological) factors, those changes in ways and forms of work of the person in these systems which often demand serious reorganization of perception.

2. Specific "universalization" of consciousness reflects the growing commitment of individual perception to stereotypes and patterns, concrete schemes of information organization, from which emotional elements are eliminated (Ignatyev, 2017; Laghi, Schneider, Vitoroulis, & Coplan, 2013).

3. The impact of information technologies is spreading even more to the human brain, gradually accustoming it to pass through its "neural networks" huge amounts of information, to work in the mode of performing several tasks simultaneously. However, there is a view that the increase in the incoming information volume, as well as the acceleration of its processing by a person, has a devastating effect on the people's thinking abilities.

4. People are increasingly dependent on technology in the field of information processing, they are deduced from the situation of reflection, contemplation, comparison of information blocks. They only

analyze deliverables issued by electronic systems or found on the Internet. This leads to a reduction in independent thinking processes and a reduction in the number of innovative developments (Spitzer, 2012).

5. In an IT environment, the ability to "filter out" the necessary information becomes very important. In order to solve this problem, special intelligent programs are created to obtain the necessary information according to the parameters set by a customer. Essentially, there is an intelligent technological "slave" without which a person cannot fulfill a simple task. For this very purpose, "artificial intelligence" is created; according to Kurzweil (2012), in the near future, it will become a common software product that can be used in a variety of situations (p.75-84). An intellectual assistant is already so important for a modern person's life that its absence or breakage turns into a dramatic episode.

7. Conclusion

Forewarned is forearmed. This phrase defines the basic task of philosophical reflection - to evaluate the state and the dynamics of the social situation, to elicit the factors that act as drivers of social development. The system analysis of the information development problems has shown that the accelerating expansion of technological innovations leads to the emergence of new social and socio-psychological problems caused by the complex nature of human interaction with information systems. Such problems as reliability and ergonomics, availability and safety of information technology, as well as computer literacy and psychological stability of the individual are highlighted. The exacerbation of these problems can not only cause irreparable damage to human health and psyche but also inevitably lead to the discrediting of new ideas in science and technology and loss of faith in technological progress. The priority of anthropogenic approaches, the development of social and humanitarian expertise of information projects, which provides legislative analysis of the social consequences of technical innovations and control over implementation of new technologies with consideration to potential danger to a person's physical and mental health, are able to bring scientific knowledge in this field to a new level that meets social demands and relieve the acuteness of the problem of scientists and engineers social responsibility, promoting the ideas of intensive informatization.

References

- Aseeva, I. A., & Pirozhkova, S. V. (2015). Prognosticheskie podhody i eticheskie osnovaniya tekhnosocial'noj ekspertizy [Prognostic Approaches and Ethical Foundations of Technosocial Expertise]. *Voprosy Filosofii*, 12, 65–76. [in Rus.].
- Asmolv, A. G., & Asmolv, G. A. (2019). Internet kak generativnoe prostranstvo: istoriko-evolyucionnaya perspektiva [Internet as generative space: historical and evolutionary perspective]. *Voprosy Psikhologii*, 4, 1-26. [in Rus.].
- Felt, U., Schumann, S., Schwarz, C. G., & Strassnig, M. (2014). Technology of Imagination: A Card-Based Public Engagement Method for Debating Emerging Technologies. *Qualitative Research*, 14(2), 233–251. <https://doi.org/10.1177/1468794112468468>
- Fuller, S. (2009). Knowledge politics and new converging technologies: A social epistemological perspective. *Innovation – The European Journal of Social Science Research*, 22(1), 7–34. <https://doi.org/10.1080/13511610902770552>
- Grebenshchikova, E. G. (2016). NBIC-Convergence and Technoethics: Common Ethical Perspective. *International Journal of Technoethics*, 7(1), 77-84. <https://doi.org/10.4018/IJT.2016010106>

- Ignatyev, V. I. (2017). Informacionnaya peregruzka social'noj sistemy i eyo social'nye posledstviya [Information overloads of the social system and its social consequences]. *Sotsiologicheskie issledovaniya*, 5, 57–67. [in Rus.]. <https://doi.org/10.7868/S0132162517070017>
- Kurzweil, R. (2012). *How to Create a Mind: The Secret of Human Thought Revealed*. New York: Viking Books.
- Laghi, F., Schneider, B., Vitoroulis, I., & Coplan, R. (2013). Knowing when not to use the Internet: Shyness and adolescents' on-line and off-line interactions with friends. *Computers in Human Behavior*, 29, 51–57. <https://doi.org/10.1016/j.chb.2012.07.015>
- Lukov, V. A. (2018). Rossijskaya molodezh' o biotekhnologicheskikh proektah «uluchsheniya» cheloveka [Russian young people about biotechnology projects to “improve” the human]. *Sotsiologicheskie issledovaniya*, 4, 73-81 (In Rus.). <https://doi.org/10.7868/S0132162518040086>
- Pirozhkova, S. V. (2018). Socio-Humanistic Support for Technological Development: What Should It Be Like? *Herald of the Russian Academy of Sciences*, 88(3) 210–219. <https://doi.org/10.1134/S1019331618030073>
- Selin, C., Campbell, K., Ridder-Vignone, K., Sadowski, J., Allende, C., Altamirano, G., Davies, S., & Guston, D. (2016). Experiments in engagement: Designing public engagement with science and technology for capacity building. *Public Understanding of Science*, 6, 634-649. <https://doi.org/10.1177/0963662515620970>
- Shushpanova, I. S. (2018). «Postpravda» v social'noj real'nosti: riski i ugrozy [«Post-truth» in social reality: risks and threats]. *Sotsiologicheskie issledovaniya*, 12, 94-104. [in Rus.]. <https://doi.org/10.31857/S013216250003173-3>
- Soldatova, G. U., & Rasskazova, E. I. (2017). «Oborotnaya storona» cifrovoj kompetentnosti rossijskih podrostkov: illyuziya kompetentnosti i riskovannoe povedenie online [The dark side of digital competence of Russian adolescents: Illusion of competence & risky behavior online]. *Voprosy Psikhologii*, 3, 3-15. [in Rus.].
- Spitzer, M. (2012). Digitale Demenz. Wie wir uns und unsere Kinder um den Verstand bringen [Digital Dementia. How we kill ourselves and our children]. Droemer Verlag, München [In Ger.].
- Strand, R., & Kaiser, M. (2015, January 23). Report on Ethical Issues Raised by Emerging Sciences and Technologies. *Report written for the Council of Europe, Committee of Bioethics*, SVT University of Bergen Norway.
- Tutton, R. (2011). Promising Pessimism: Reading the Futures to Be Avoided in Biotech. *Social Studies of Science*, 41(3), 411–429. <https://doi.org/10.1177/0306312710397398>