

GCPMED 2018
**International Scientific Conference "Global Challenges and
Prospects of the Modern Economic Development"**

**DIGITAL ETHICS AS AN INSTRUMENT FOR THE
TECHNOLOGICAL CHALLENGES' REGULATION**

A.V. Guryanova (a)*, A.A. Shestakov (b), E.G. Noskov (c)

*Corresponding author

(a) Samara State University of Economics, Soviet Army Str., 141, 443090, Samara, Russia, e-mail: ecun@sseu.ru

(b) Samara State Technical University, Molodogvardeyskaya Str., 244, 443001, Samara, Russia, e-mail:
upd@samgtu.ru

(c) Samara State Technical University, Molodogvardeyskaya Str., 244, 443001, Samara, Russia, e-mail:
upd@samgtu.ru

Abstract

The article considers the subject and the problem field of the modern digital ethics. Different conceptions of the digital ethics are discussed too. These conceptions are divided into classic and modern, realist and futurist, alarmist and non-alarmist. Initial development of the digital ethics is analyzed on the base of N. Wiener's and J. Weizenbaum's works. Positions of alarmism and non-alarmism in the digital ethics and conceptions of the digital ontology by R. Capurro and L. Floridi are the subject of analysis in the article. Special attention is paid to the technological challenges of the digital epoch because of their impact on the humans, society and environment. In this context the problems of ubiquitous robotization, artificial intelligence, machine ethics and free access to the Internet are considered from the ethical point of view. Digital technologies' impact on human existence is also discussed in the context of equity absence in using the digital achievements, of human interaction with technical intermediaries and of «homo digital's» formation. In general, the authors try to form an objective view on digital ethics, differed from the outdated hypotheses of science fiction and from its popular alarmist interpretations. They also try to integrate digital technologies and human values in such a way that the first ones won't conflict the last ones but protect and develop them.

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Keywords: Digital ethics, digital technology, digital divide, alarmism, artificial intelligence, homo digital.



1. Introduction

There is a traditional genre of the science fiction, where digital technology is often presented as a mysterious, sometimes dangerous and even a terrible thing. However, digital mechanisms are the result of the progress of human mind. They aren't a number of devil instruments that have been the bearers of evil from the very beginning. But their using can lead to various of consequences, and quite often they become destructive in their essence. However, destructiveness can't arise without any reasons. It is a result of a certain way of human behavior. So, the source of ethical dimension of the digital machines is always connected with actions of the human – its direct creator and user. Therefore, it's impossible to consider the digital environment represented by data, algorithms, software and different devices in isolation from anthropological, economic and political practices.

Development of the modern society have made it first industrial, then information and finally the digital one. This transformation is multidimensional in its essence as it affects all the spheres of modern society existence. Over time, technological development becomes more and more intensive. And there is a risk that understanding of its consequences doesn't keep up with the rate of its development. Modern society perceives the computer as an essential intermediary. And it mediates not only the common life but even the modeling of philosophical theories and ideas (Bynum & Moor, 1998, p. 6). Today there is a whole generation of people who can't imagine their lives without modern technologies. It is the so-called «digital natives», according to M. Prensky's terminology (Prensky, 2009).

In the modern state the scientific researches covering the areas of both digital ethics, machine ethics, robot ethics, etc. are extremely large-scale projected and focused on the study of the fundamentally unfinished object. We don't plan in the present article to give its full vision, but to explore the digital environment in its human-oriented dimension, from the standpoint of the digital ethics.

2. Problem Statement

Digital technologies and information networks are widely used in the various spheres of modern life – economic, political, environmental and others. They cause new and sometimes unpredictable challenges that often outpace the related problems of ethical, theoretical and legal character (Guryanova, Astafeva, Filatova, Khafiyatullina, & Guryanov, 2019). Digital ethics considers ethical questions connected with computer and information technologies, their impact on the society and the human values. At the same time, it widely uses the conceptions of philosophy, sociology, law, psychology and other humanities (Smithies, 2017). Digital ethics is a very interesting subject from the point of view of philosophy. On the one hand, because the digital technologies are widely used nowadays, on the other – because their application raises serious conceptual questions and ethical problems for the modern society. Digital technologies make us discover new moral values, formulate new moral principles, develop new theories and look for the new ways of thinking about the questions presented to us (Mariasaria, 2014).

Already in 1985 James Moor published his classic essay entitled «What is computer ethics?» (Moor, 1985). In this essay philosopher claimed the application of computer technology has limitless potential. It's only necessary to solve ethical problems arising on this way. According to Moor, computer ethics includes several important problems: identification of computer-generated vacuum; clarification of

conceptual confusions; development of the strategy for computer technologies' using and the ethical foundations of this strategy. Intellectual property, security, information overload, the digital divide, gender discrimination, artificial intermediaries, virtual reality, true and actual environmental information are the main topics of the modern digital ethics (Himma & Tavani, 2008). It also concerns questions of Internet addiction, control, robotics, privacy in the terms of intercultural communication. The study of the listed ethical aspects can help to overcome the problems and find the right solutions for the technological challenges of the digital age (Capurro, 2006).

There are many concepts related to the term of «digital ethics» (Davisson & Booth, 2017) such as «computer ethics» (Dedyulina, 2015), «machine ethics» (Anderson & Anderson, 2011), «robot ethics» (Lin, Abney, & Bekey, 2011), «information ethics» (Capurro, 2006), etc. All these concepts appeared in the scientific literature in the seventies of the last century. But they are absolutely actual nowadays too. On closer examination there are many points of contact between them. All these terms are interrelated because of affecting the ethical problems of the ICT using, their impact on humans, society and environment. All these aspects form together a problem field of the modern digital ethics. It can be also extended by the following debatable questions: Is it ethical to delegate the moral decision-making to the machines? Is there a standard of moral behavior suitable for computing systems and software? Is it possible for the machines having a high-quality imitation of human behavior, to «understand» ethical postulates as the humans do? If technology doesn't need such an «understanding», can it share with the humans their moral conventions, having in view that these conventions are true only in certain circumstances?

All these questions haven't yet resolved by the modern humanity. They require an active discussion and comparison of views of different specialists. And we'll try to do it in the present article. However, we won't produce the universal answers. Today digital ethics is a field for scientific doubts and disputes.

3. Research Questions

The main research questions for the present study are:

- What is the subject and the problem field of the modern digital ethics?
- Which conceptions of digital ethics are more preferable in the modern conditions?
- Who is right in interpreting the impact of digitalization on modern humans – alarmists or non-alarmists?

Is it real to integrate digital technology and human values in the modern world?

4. Purpose of the Study

This study tries to solve the following problems:

- To characterize digital ethics, to consider research approaches and opinions on its nature and problem field.
- To analyze the way of its historical development and its modern conceptional state.

- To form an objective view on digital ethics, differed from the outdated hypotheses of science fiction and from its modern alarmist interpretations.
- To integrate digital technology and human values in such a way that the technology will have to protect human values and not to conflict them.

5. Research Methods

Methodological basis of the present research is formed by the classic and modern conceptions of digitalization and digital ethics. Their authors are Wiener (1961), Weizenbaum (1976), Searle (1992), Floridi (2010), Capurro (2006), Bostrom (2014) and some other writers.

Methods of the research are various and multilateral.

5.1. Method of philosophical analysis

We have already mentioned that digital ethics is a very interesting subject from the point of view of philosophy. So, philosophical method is widely used in the research. It helps the authors to consider a large variety of digital technologies impacting the modern society and serious conceptual questions and ethical problems connected with them.

5.2. Method of dialectical analysis

Method of dialectical analysis makes possible to create a full vision of the researching object – the digital ethics – in its historical development, modern state and future perspectives. Using of dialectical method permit the authors to describe the wide changes taking place both in the digital society and in human existence. It's obvious that these processes are dialectically interrelated and interdependent.

5.3. Comparative method

Using the comparative method, the authors consider the views of different specialists – scientists and philosophers, modern and classic – on the digital ethics and its problem field. This procedure is necessary to form an objective view on digital ethics, free from the traditional science fiction and from the alarmist interpretations which are very popular nowadays.

5.4. Integrative method

Using the integrative method, the authors of the article form a complete vision of the problem field of the digital ethics including problems of information and communication technology (ICT) development and using, their impact on humans, society and environment.

6. Findings

6.1. Conceptions of digital ethics

Conceptions of digital ethics differ much one from each other. They can be realist and futurist, optimist and pessimist, alarmist and non-alarmist, etc. However, the ethical problems discussed in them don't have final solutions nowadays. In the present research the authors try to identify, analyze and

evaluate the most significant conceptions of the modern digital ethics. It's necessary to form an objective view on digital ethics, distanced both from the science fiction and from the modern alarmist views. Perhaps this approach will set the vector of really scientific, non-alarmist vision of the digital world.

6.1.1. Initial development of the digital ethics: N. Wiener and J. Weizenbaum

For the first time the problems of technology impact on humans and society were analyzed in the works of Norbert Wiener – an American mathematician and philosopher. Wiener is also known as the founder of cybernetics. His famous work «Cybernetics: Or Control and Communication in the Animal and the Machine» (Wiener, 1961) was published in 1948. The second work in this field – «Human Use of Human Beings: Cybernetics and Society» (Wiener, 1988) – was published in 1950. Strictly speaking, the term of «computer ethics» didn't exist at that time. It began to be used later, around the seventies of the XX century. But Wiener was the first who identified a new problem field connected with the using of machines and computer systems. He also developed methodology and strategies for ethical analysis of these problems, formulated the main ethical principles and values, predicted an appearance of the new ethical problems connected with increasing development of technology in the nearest future.

In 1976 a German American computer scientist Joseph Weizenbaum published his work «Computer Power and Human Reason: From Judgment to Calculation» (Weizenbaum, 1976) that has made a great contribution to the development of computer ethics. Weizenbaum made the following conclusion in this work: many problems of electronic computing development have an exclusively ethical nature. Therefore, the question of replacing a human by computer systems is not only a question of potential technical realization, but also of ethical legitimacy. Weizenbaum, as well as Wiener, attracted attention to the ethical problems connected with computer creation and using. Since that time, it became clear that the social significance of computer ethics can be compared with the significance of the nuclear energy. The discussion was initially focused on the moral responsibility of computer specialists. Then, discussing an impact of computer technology on human life, Wiener and Weizenbaum meant it affected society as a whole.

6.1.2. Alarmism and non-alarmism in the digital ethics

Alarmism is a wide-spread phenomenon in the field of the modern digital ethics. It is closely related with the whole history of the moral philosophy. One of the well-known modern alarmists is Nick Bostrom – a famous Swedish philosopher-transhumanist. The main question of Bostrom's conception is the same: What happens when our computers get smarter than we are? And his answer is really pessimistic: If machines become smarter, they will enslave us. It's necessary to mention that this position on the impact of the modern technological revolution is typical for many modern scientists and philosophers. Bostrom qualifies artificial intelligence (AI) as one of the global risks to the humanity existence itself (Bostrom, 2014).

Philosopher is sure, if machine brains surpass human brains in general intelligence, the new superintelligence will appear. And it can easily replace humans as the dominant lifeform on the Earth (Bostrom, 2014). In the worst-case intelligent machines will improve their own capabilities faster than human computer scientists. And this will be a real existential catastrophe for the humanity. In order to

prevent such a scenario Bostrom advises to pay maximum attention to successful solving of the «AI control problem». This should be already done in relation to the first superintelligence. Solving the «AI control problem» is a difficult task. But it's very important too for the future human survival as it can make the new superintelligence tolerant to the goals of human well-being.

Alarmism opponents – a number of non-alarmist scientists and philosophers – are sure, artificial intelligence is a tool to improve the high quality of human life. For example, an American philosopher John Searle thinks, machines will never get self-consciousness (Searle, 1992). Searle develops the ideas of biological naturalism. According to it, we can create a conscious being only if we duplicate the real physical and chemical processes the human brain goes through. In the case of computer intelligence, it's impossible. As soon as a certain kind of software is running on a computer, it's doesn't mean a conscious being is thereby created.

Modern humanity is standing on the way of creating a digital environment. So, the norms of communication within the digital environment, in the fields of artificial intelligence and self-learning systems should be immediately developed. M. Anderson and S. L. Anderson try to focus the discussion about the digital ethics not on the traditional opposition between the humans and the machines they create but on the need for thoughtful engineering. The last one should be really useful and trustworthy for the modern humanity (Anderson & Anderson, 2011). It's necessary to point, the Andersons' conception has a rather unemotional character. The authors believe, it's necessary to complete traditional arguments about responsibility of the human as a user and developer of the intelligent systems with an interdisciplinary discussion about the machine ethical decision-making. At least, we are increasingly involved into the process of autonomous mechanisms' production. Therefore, we are vitally interested in fact that these mechanisms might have an algorithmically verified idea of the moral side of their «behavior».

6.1.3. Digital ontology of R. Capurro and L. Floridi

Conceptions of digital ontology are very popular today. Their appearance is a reaction to an increasing impact of digital technology on human existence and social life. The most famous works in this field belong to Capurro (2006) and Floridi (2010). They both study information ethics basing on the ontological approach, but they have different views on axiological problems arising in the process of information using. Floridi offers an ecological approach, while Capurro analyzes the problems of information ethics through the ontology of information environment. According to Capurro, digital globalization should teach us to interact with each other in conditions of the united world. This relativization of the digital possibilities he calls the «digital ontology» (Capurro, 2006).

Computer ethics for Capurro is first of all an applied science. It tries to solve the actual problems that require their application in practice. These are the problems of digital inequality, moral regulation in the Internet and the Internet myths. These are also the questions arising in the areas of computer technology using, ethical regulation of the media, moral and normative regulation of the information business environment, etc. Meanwhile, information ethics is not only a set of norms, but a critical reflection on the possibilities of a better human life in the modern world. So, Capurro poses a question: Who are we in the digital age (Capurro, 2017c)? Today different cultures are undergoing digital hybridization. This process affects social life in all its aspects, determines interaction of human and

society with nature. The main task of information ethics is to acquaint us with the problems and alternatives of the personal and public life formation. According to Capurro, the study of ethics should help us to overcome ethical problems and find reasonable solutions for the technological challenges of the digital age (Capurro, 2017a).

In his turn, Floridi explores the problems of computer ethics basing on its metaphysical foundations. The terms of «computer ethics» and «information ethics» are the concepts close in meaning for him. He is sure, information ethics is a part of environmental ethics. Information technology and information systems are incorporated into the environment through a value system. The scientist identifies three components of the information ethics: information as a resource, information as a product and information as an environment (Floridi, 2010). According to Floridi, every object of the information environment has its own information value. Therefore, the main purpose of ecological control in this area is to grow information objects and make them successful in the information environment. The purpose of information ethics is to explain the basics and to analyze critically the moral values of information using. It should also realize critical interpretation and empirical study of the ethical questions related to information.

In general, the works in digital ontology created by R. Capurro and L. Floridi promote the development of digital ethics as an independent scientific discipline.

6.2. Technological challenges as a subject of the digital ethics

From the beginning of the XX century information and communication technologies have developed rapidly, changing traditional way of human life, causing formation of new industries and professions (Bounfour, 2016). First of all, this process has affected the media sphere. In the XXI century all traditional media – radio, television, newspapers – have become digital. At the same time the new media, originally created as digital, have begun to develop. After that digital format and digital technologies have begun to transform different industries such as energy, construction, transport, etc. So, digital technologies are ubiquitous in the modern society. We are talking about Internet, mobile phones and other resources of collecting, storing, analyzing and exchanging information in a digital form. All these digital technologies spread rapidly and manifest themselves in different spheres of social life, especially in the field of robotics, where they cause a number of important ethical challenges.

6.2.1. Ubiquitous robotization and the problem of machine ethics

Development of robotics is a necessary element of digitalization. The newest advances in the field of robotics are widely used in our everyday life as well as in industrial, medical, military and other social spheres. This greatly changes the way of human life. Modern robots can take care of patients, help us in infrastructure and agriculture and realize many other important services. They take part in automatizing business and education processes, in modernizing of the service sector. Despite this, intellectual and ethical dialogue between the humans and the robots is still on the stage of its infancy (Capurro, 2006). The process of robots turning into the «moral machines» requires special reflection. As well as the process of creating a special «roboethics» for them (Capurro, 2017b).

The intensive development of robotics poses a number of actual questions for the digital ethics. They are detailly discussed by P. Lin, K. Abney and G. A. Bekey in their work «Robot ethics: the ethical and social implications of robotics» (Lin, Abney, & Bekey, 2011). First of all, they mention the following fact: if we talk about robots as about the moral machines, we must consider the certain sphere of their application. For example, the drones involved in the military operations don't use in their actions the same moral dimension as the medical robots do in the health sector. Secondly, each industry where robotic objects are used (military affairs, health system, etc.) and each social practice where they are involved (for example, practice of violence, care, concern and assistance), has its own interpretation of the term of «ethical». And this interpretation is not constant.

Strictly speaking, people can't reach an agreement on moral questions even at the level of human relations (for example, is the murder always a crime?) Therefore, they are not able to teach robotic systems some universal ethical norms. These rules will be always situational and dependent on specific legal settings. This means their potential danger to those who have another worldview based on the different conventions. Besides, the robotic component of the digital environment denies traditional foundations of the social world. For example, the machine reproducing the practice of «care» may destroy the previous institutes of social relations between the humans.

Modern researchers actively discuss the binary opposition of the humans and the robots. The most important ethical questions here are the same: will the people need human friendship or love if the robotic equivalents will become more accessible for them? And if we create the machines which are «close», «similar» to the humans, why don't we protect their rights? And if we don't do this, we stimulate an aggressive behavior towards these complex systems. Thus, the very development of online / offline realities including the robotic systems leads to the ethical nihilism (Lin, Abney, & Bekey, 2011). And if we can't qualify exactly some robots' actions as ethical or unethical (for example, what is an ethical assessment of the actions of the military drone?) does it mean that ethics is unimportant in the digital world?

All these questions need special discussion and resolution in the nearest future. This is necessary to create a right development strategy of the digital society.

6.2.2. Free access to the Internet as a fundamental ethical principle

In 1982 the computer network named «Internet» was created in the USA. Initially, the Internet was only a military project. Until 1990 it was impossible to use it in business and communication spheres. Then the situation has changed, and the control over Internet has passed to private structures. The Internet access services were provided by private companies. Since that time, the network has been constantly growing, increasing a number of connected users. Telecommunication technologies and other communication resources have developed too. In the very beginning, the Internet was used only for e-mail transmission, but finally it acquired capacities of the significant data transmission.

Today the Internet is a main infrastructure of social communication at the local and global levels. This has brought obvious benefits to its users: it has become easier and more convenient to communicate and receive information; the free digital products and the new forms of leisure have appeared; the forms of business communication have simplified much. A sense of deep social relation and global community

has also appeared. According to the World Bank, the number of the Internet users has grown more than three times over the recent ten years: in 2005 it was 1 billion and in 2015 – already 3.2 billion of people. In 2017 every second inhabitant of the planet was connected to the Internet. And in the next 20 years, according to the forecast of McKinsey Global Institute (MGI), up to 50% operations in the world will become automated (Digital Russia, 2017).

However, these processes are not ubiquitous. There are digital divides in the fields of availability and using of the digital technologies. Digital revolution has a small impact on the lives of the most part of modern people. Only about 15% of them can pay for the Internet access. Mobile phones are the main resources of Internet access in developing countries. But only about 80% of the world's population have mobile phones nowadays. Almost 2 billion people don't have mobile phones at all, and about 60% of the world's population doesn't have access to the Internet (Wiener, 1988). Today, there are not only digital divides between different countries, but the deep divides within each local country. We talk about the divides between the poor and the rich people, between urban and rural areas, between the young and those whose age is over 45. The last divide is also known as a divide between “digital natives” and “digital immigrants”. The only way to resolve this conflict by the generation of digital immigrants is to acquire the new skills and to integrate themselves into a new digital reality (Prensky, 2009).

The authors of the present research are sure, today the free access to the Internet is a fundamental ethical principle. It is similar to the principles of the free speech and the free press. In the digital society the free access to the Internet must be equaled to the inalienable human rights such as the right to freedom of thought, conscience and religion. Perhaps, the traditional list of inalienable human rights must be corrected and added by the new components in the modern conditions. But in any case, the ethical problem of free access to the Internet must be solved in the nearest future. The digital divides can't be overcome without it.

6.2.3. Digital technologies' impact on social life and human existence

Digital technologies influence greatly the social life and the human existence. And they have a number of the far-going existential consequences. Most of them are connected with an ethical area. For example, an absence of equity in using the digital achievements leading to the new forms of social discrimination. Without paying attention to this problem, it can cause serious risks of social inequality and instability. In the similar ethical context, it's necessary to mention the problem of human interaction with different kinds of technical intermediaries, including the problems of interpersonal relations and professional ethics; the problem of a labor market (we are talking about the fact that a number of professions will soon disappear due to the replacement of human labor by the automated mechanisms' working).

There are also the changes in moral norms of human behavior caused by the widespread and accessible character of information about activities of social and political structures, institutions and commercial companies (Shestakov, Stotskaya, Mingulov, & Zaitseva, 2017). Digital society faces the following ethical risks: the risk of changing of the confidential boundaries both in professional and private spheres, up to disappearance of the privacy itself; the risk of unethical using of the digital achievements for commercial or political goals realized by individuals or social groups; the risk of the

privacy violation and creation the total control system on this base. And finally, there is a danger of automatic systems out of control, such as computer errors that can cause technogenic catastrophes.

Under an influence of the digital technologies the human himself changes much (Guryanova, Khafiyatullina, Kolibanov, Makhovikov, & Frolov, 2018), acquires new qualities and properties. So, he'll become a real «homo digital» in the nearest future. Mark Prensky wrote about these anthropological changes in his classical work «Homo sapiens digital: from digital immigrants and digital natives to digital wisdom» (Prensky, 2009). In his interpretation «homo digital» is such a human who considers technology as an integral part of his own life in a wide variety of aspects. He may be a representative of the «digital natives'» generation or a well-adapted «digital immigrant». In any case he will realize a fundamentally new way of human existence characterized by new requirements, for example, for a leadership.

To become a leader in the digital society it's necessary acquire a number of specific qualities. D. Tapscott in his famous work «The Digital Economy: Promise and Peril in the Age of Networked Intelligence» discusses this question thoroughly. He points the most important characters for the digital leadership. They are a constant focus on transformation; an ability to learn quickly and constantly and to work in the team; always showing willingness to use digital networks and to take a personal part in all the transformations (Tapscott, 2014). All these requirements help to form a real «homo digital» as a subject of the new digital ethics ready to respond adequately to the technological challenges of the modern life.

7. Conclusion

The subject and the problem field of the modern digital ethics were analyzed in the present research. The authors listed and considered the most important problems of the modern digital ethics. Intellectual property and privacy, security and information overload, digital divides and artificial intellect, technical intermediaries and virtual reality, access to the Internet and Internet addiction, control and robotics are among them. All these problems have an ethical character and impact much the humans, the society and the environment. And their set isn't fully complete. Because the modern digital ethics is a field for scientific doubts and disputes.

The authors paid special attention to the conceptions of the digital ethics which differ much one from each other. They are divided into classic and modern, realist and futurist, alarmist and non-alarmist. The authors prefer most of all the non-alarmist approach to the point of their research interest. They agree with the fact that artificial intelligence is a tool to improve the high quality of human life in our days and in future. The conceptions of digital ontology seem very interesting too. Their findings can help to overcome ethical problems and find reasonable solutions for the technological challenges of the digital age. In general, the works in digital ontology promote the development of digital ethics as an independent scientific discipline.

It was mentioned in the article that digital technologies spread rapidly and manifest themselves in different spheres of social life, especially in the field of robotics, where they cause a number of important ethical challenges. Development of robotics is qualified as a necessary element of digitalization. The newest advances in this field are widely used in our everyday life. But the principles of the ethical dialogue between the humans and the robots are still on the stage of their infancy. As well as a special «roboethics» that must be created to regulate this delicate sphere of the digital activities.

Digital technologies influence greatly the way of human existence. So, they have a number of the far-going consequences connected closely with an ethical area. These are the problems of equity absence in using the digital achievements, the problem of human interaction with technical intermediaries, the problem of «homo digital» formation and some others. The free access to the Internet is considered as a fundamental ethical problem too. The authors are sure, this problem must be equaled to the inalienable human rights such as the right to freedom of thought, conscience and religion. It's the only real way to overcome the digital divides in the modern society.

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