

DOI: <https://doi.org/10.33216/1998-7927-2019-254-6-45-52>

UDC 008+004(091)

## TO THE HISTORY OF THE INFLUENCE OF IT-TECHNOLOGIES ON THE FORMATION AND DEVELOPMENT OF A MODERN INFORMATION SOCIETY

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## ДО ІСТОРІЇ ВПЛИВУ ІТ-ТЕХНОЛОГІЙ НА СТАНОВЛЕННЯ ТА РОЗВИТОК СУЧАСНОГО ІНФОРМАЦІЙНОГО СУСПІЛЬСТВА

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*The human universe in its development has undergone several stages of civilization transformation. Each of these stages is characterized by a set of etiologic features that directly influenced the quality of life of the society, and hence on all aspects of being at both the micro and macro level, if we consider the existence and functioning of social and political organisms as a system. Technological innovations almost always throughout the studied history in any society reflected social values and, in turn, transformed society in varying degrees.*

*The development of machine-based information processing techniques has influenced the rapid transformation of a modern society from industrial to post-industrial information society.*

*The article briefly describes the key moments of the emergence of the fundamental machine methods of information processing and digital technologies that influenced the formation of the modern information society and its functioning in all aspects of life in the general daily accessibility of a large array of the information which is different by quality.*

**Key words:** *civilizational transformation, information society, IT-technologies, robots, Artificial Intelligence (AI), machine methods of information processing*

**Introduction.** During each civilization stage, mankind accumulated information as useful for the conditions of existence within each chronotope, and unclaimed in the realities of that time. An array of this information was passed from generation to generation in various ways, creating, in the end, a historical background of processes that took place "here and now" in multi-level formations in the context of their existence in all spheres of human society.

At the same time, the accumulated information, as a set of knowledge about the surrounding world and its conditions of existence, which was transformed by people through imaginary modeling of reality, formed science as such. That is why science is considered as

one of the types of socio-cultural creativity of the historical subject. Each civilization stage did not start from scratch. The basic level was the achievement of previous generations.

Modern society is characterized as post-industrial, or information on the main product of its production - information, although it can not be said that this civilization phase of development of the planetary scale.

However, given the historical events of the past thirty years, it can be confidently stated that information technologies have been active in influencing the transformation of everyday life and, in general, the existence of all strata of the population and all social groups in most countries of the world.

Information can not exist on its own. According to the theory of information, it is stored and transmitted only on a material carrier by means of energy. Oral transmission of information also falls under this postulate, because the nervous system of living organisms is a specific set of communication channels. It is this feature that became the basis of the creation of artificial intelligence, which more directly or indirectly influences the course of events in all spheres of society, ranging from the impact on fundamental human rights and freedoms to the cultural and spiritual sphere.

**Formulation of the problem.** Under the influence of the scientific and technological revolution of the second half of the 20th century, due to the amount of information accumulated by humanity and in response to the increasing overall rate of its use and the demands of society, in the last decades there has been a rapid development of machine information technologies. And this pace of development is constantly accelerating, which makes many scholars, for example [1], - to call colleagues and society for caution. They warn about the high probability of technological singularity soon, with

all probable, predicted decades ago, the consequences for human civilization. According to experts, the proliferation of military robots is comparable in value to the invention of gunpowder and nuclear weapons in the historical-civilizational sense.

**Analysis of recent research and publications.** It should be noted that there is a significant lack of specialized historical historiography of the issue under study. Different aspects of the formation and existence of the information society are considered mainly from the point of view of sociology, informatization, political science, economics, etc. In the domestic space in general, there are no highly specialized historical studies of this issue. However, foreign historiography on this topic in historical aspect also is not quite significant. Showing a certain historical background, researchers mainly consider the practical issues of adaptation of different segments and groups of society to rapidly increasing technological innovations and the information sphere in general. The whole array of such historiography can not be analyzed within the framework of one article, but on some studies it is worthwhile to stop.

In Ukraine, the first who initiated a substantial renovation of the tools of historical research, drawing mathematical and machine methods into the analysis of science and technology, in particular the possibilities of electronic computers that originated in our country, became the founder of the Ukrainian science-education school Gennady Mikhailovich Dobrov [2].

In 1966, he advanced the idea of combining historical, scientific and scientific studies, in which the application of machine methods in historical and research studies for information processing had to facilitate the obtaining of results that could be used to identify the growth and potential points of new areas of science and science-technical progress. In the same year, he published his fundamental monograph "Science of Science" [3], which was reprinted in the seventeen countries of the world and has not lost its relevance in our time. Unfortunately, for the general public in the Ukrainian information space, the name of this outstanding scientist, who became one of the founders of domestic science-science, remains almost unknown.

In the 1970s, another domestic scientist – E.P. Semenyuk [4], – began to study in his works the information approach to the knowledge of reality. He analyzed the role of the information approach in understanding and solving such pressing problems of social development, as the economy transformation, management of social processes, the formation of public consciousness.

Some aspects in the context of our subjects considered in the researches of L.G. Khomenko [5], which had historical and scientific analysis of the experience of the formation of the cybernetic worldview and repressive response to its origin, to construct a theory of artificial intelligence in the former USSR and shows the evolution of Ukrainian cybernetics from the initial concept to the formation informatics as a science that studies in-

formation processes and systems in a social environment.

In the analytical report of the National Institute of Strategic Studies of Ukraine (2010) [6], the author's team noted that the information society could become an element for Ukraine that would allow it to provide a worthy place among the world's leading countries.

The most interesting and original work affecting our subject matter, in our opinion, is the book of Israeli historian and a professor in the Department of History at the Hebrew University of Jerusalem Yuval Noah Harari "Homo Deus: A Brief History of Tomorrow" [7]. We point out that this is not a strictly scientific, it's a popular science book for the masses, but it has a professional historical approach. The author believes that the language revolution was about 70,000 years ago, after which people began to live in the framework of "intersubjective reality", such as countries, borders, religion, money and so on, which were created to provide large-scale and flexible cooperation between individuals. Humanity is separated from animals by the ability of people to believe in these intersubjective constructions, which exist only in the human mind and are given by force through collective beliefs. The political system, says Harari, is no longer able to respond to new technological challenges, as the world changes too quickly and politicians do not have time to form a vision and plan for the future. In his opinion, today people are turning to algorithms rather than the church for answers. Harari believes that new religions will soon come to the forefront - dataism and technohumanism. It should be noted that the author operates large-scale abstractions, however, he does not provide well-structured logical constructions on the issue of important and fundamental defining differences between people ("organic algorithms") and computer algorithms.

Consequently, we must declare that the question under study is, for the most part, not fully disclosed in the information space of both domestic and English-language resources, publications, journals, etc.

**The purpose of research.** Briefly to describe the key moments of the emergence of the fundamental machine methods of information processing and digital technologies that influenced the formation of the modern information society and its functioning in all aspects of life in the general daily accessibility of a large array of the information which is different by quality.

#### **Materials and research results.**

A special feature of the informational sphere of modern society is its fundamentally undiscovered and, at the same time, a multidimensional character [8]. This determines the specificity of the methodological approach for the processing of information. Information is not only the main object of historical research. It is also a common object to which the methods of different sciences are directed. An important aspect is that the actual informational message is always selected from a set of possible messages [9], which makes the information suitable for mathematical and machine processing methods.

That is, the transfer of information is a physical process that can be described mathematically. Hence, the process of information retrieval and processing in order to acquire new knowledge for the benefit of society can be maximally optimized with the help of machine methods of processing large and varied data arrays.

Studies in 2011 [10] showed that 95% of all existing information in the world was digitized and accessible to the public through computer networks.

It can be argued that the global Internet has become the main technology of the information age. Initially, this network, like many modern technologies and equipment, was developed for the needs of the military. The modern Internet has evolved from the Arpanet network, which was developed by the United States Department of Defense Advanced Research Projects Agency and tested for the first time on October 29, 1969, and ended its functioning in June 1990. The Internet that replaced it has spread around the world at great speed.

The world's first website was created by the inventor of the World Wide Web (1989) and Turing Award Winner (2016) T. Berners-Lee at <http://info.cern.ch>. [11] This site appeared online on the Internet on August 6, 1991. It is also the world's first online directory. According to research, in 1996 there were 40 million Internet users, and in 2013 there were already 2.5 billion, and the number of wireless users in 2013 was close to 7 billion. [12]

The increasingly accelerated pace of progress in the development of computer information processing today has led to the widespread use of technologies associated with the use of artificial intelligence in many areas of human activity in modern society. It should be understood that the AI, as a set of interacting different types of artificial neural networks, can include anything from a machine algorithms for searching and processing of information requests to autonomous weapons. Artificial neural networks, which are now used in many spheres of human activity, have passed the path of more than sixty years, from the complete negation of their practical utility to the almost complete correspondence of the technical system of the number of neurons in the human brain. If describe in simple terms, the artificial neural network is a mathematical model that functions as a network of nerve cells of living beings.

Basics of the theory of the brain and neuron mathematical model was developed by Charles W. McCulloch and Pitts in 1943 and published by them in the article "The logical calculus of ideas related to neural activity." And in 1948, Norbert Winner [13] – "the father of cybernetics" – published the first scientific work describing the principle of biological processes as a mathematical model. It was considered problematic behavior and reproduction of natural and artificial complex control and information systems technology, nature and society. The writing of this study by N. Wiener was triggered by two events - familiarization with physiologist Arthur Rosenblut and the Second World War, during which he was engaged in problems

of automatic control and automatic communication, using comparisons of automated devices with functions of living beings.

The next step to the beginning of modern artificial neural networks was the research of Canadian neuropsychologist D. Hebb. In 1949, he published a scientific work "Organization of Behavior: Neuropsychological Theory" [14], in which one of the first proposed a theory of the relationship between the brain and mental processes. The result of his work was the first algorithm of machine learning.

N. Wiener and D. Hebb became the founders of the primary structure of artificial neural networks and machine learning: Wiener - from a mathematical point of view, and D. Hebb - from the neurophysiological.

However, the primary model of artificial neural networks was not without disadvantages. Thus, in 1969 M. Minsky published the book "Perceptron" [15], where he criticized the research in the field of artificial neural networks and demonstrated the necessary computing resources for this.

After this critique, the interest in researching artificial neural networks has fallen sharply, but in 1972, a prominent Finnish scientist in the field of artificial neural networks and machine learning, T. Kohonen and J. Anderson almost simultaneously invented a new type of artificial neural networks that can function as a memory. The new type used associations to transform information and sample data into their fragments. It currently exists now.

So, since the 1970s, scientists around the world were interested in problems of artificial neural networks. The top point of the historical development of artificial neural networks is the anthropomorphic high-tech artificial intelligence, which since the moment of its worldwide announcement in 2017 has already put a number of acute problem-solving problems of the general human scale to the society.

Human rights are rights that all people have, regardless of race, gender, nationality, ethnicity, language, religion or any other status, and which cover all spheres of human activity. Based on the content of the fundamental international documents [16] legally enshrining human rights, they can be divided into four large groups: social, economic, cultural and political. In the broad sense, human rights encompass all types of individual rights and freedoms, and all types of injustice are related to human rights [17].

Because any human personality is formed within a certain society, civil rights have a paramount importance for the topic in question, because they are provided with positive government actions, often in the form of legislation [18].

From the point of view of the beginning of the accelerating global entry of automated systems into the sphere of human activity, and, accordingly, in the legal field, we can consider the end of World War II as a starting point. After the world somewhat recovered from the World War II in the socio-economic aspect, in the 50's of the twentieth century began the rapid

development of scientific and technical progress. To a large extent, it was the transfer of scientific and technological developments for the needs of the war on a civilian plane, which set before the scientists the task of forming completely new approaches to research on the basis of new methodological tools. [19] It can be argued that the pace of implementation and the impact of the volume of the computer systems on society is practically on a planetary scale are so increased in recent decades that have transformed many public institutions.

Chronologically robots were the first to enter the sphere of human existence. The term “robot” to the widespread use was firstly introduced by the Czech writer Karel Čapek, writing the derived word “robot” from the Czech “robota” - “forced labor” in his play “R.U.R.” (Rossumovi Univerzální Roboti, 1920), which described the artificial people. In modern terminology, the word “robot” is interpreted as “a machine that resembles a human and is capable of automatically reproducing certain human movements and functions [20]”. Later, the word “robot” became very popular from the beginning among science fiction writers, who were the first to start thinking in their works about the ethical and legal aspects of the existence and development of “artificial people” in human society.

The famous science fiction writer by calling and biochemist by education Isaac Asimov in 1941 for the first time used the word “robotics” in print, which he used in his story “Liar!”. And in 1942, in the short story “Runaround”, he in first time formulated the famous “Three Laws of Robotics”, which were supposed to regulate the behavior of robots. The first law says: “A robot cannot harm a human or by its inaction allow a human to be harmed [21]”. Later he formulated the “zero law”, which extended the influence of the first law to all humanity. These “laws” later became the base for the initial stages of technological developments in the field of creating anthropomorphic robots and AI from the point of view of the practical application of I. Kant's formalized ethics in the human community.

The term “Artificial Intelligence” for the scientific community firstly was introduced by the American computer scientist J. McCarthy in his theses in 1955 for the conference in Dartmouth in 1956. [22] The modern definition of this term is: “AI - The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages [23]”. To our opinion, this definition, taking into account modern realities, needs more specific formulations and we agree with researchers from the Information Technology Policy Center at Princeton University [24] that there is no generally accepted precise definition of “artificial intelligence” because the term “intelligence” still ambiguous.

Today, artificial intelligence is still designed to solve highly specialized tasks, but it has the potential to become smarter than any human. Now, the process of

creating and introducing the anthropomorphic robots with AI into the public life is considered mainly from the point of view of economic profits for its creators. However, the granting of citizenship to a social humanoid robot Sophia developed by Dr. Hanson from Hong Kong based company Hanson Robotics on October 25, 2017 at the Future Investment Initiative conference in Riyadh [25], which pursued primarily economic and advertising purposes, immediately created problems in legislative field. The society launched a massive debate, which boil down to whether or not to believe now that humanoid robots (androids) may possess the full range of civil rights and freedoms on an equal basis with people.

The developed robot was able to imitate 62 different facial expressions, establish eye contact, memorize people and maintain dialogue. At the same time, the android was originally intended to work in the field of education and health care, but gradually Sofia became a media person. Analyzing the numerous publications devoted to this human-like mechanism, it can be stated that the very fact of the emergence and active functioning in the information space of such a high technology has led to a change in the outlook of a large part of society in many countries. It is possible that this successful project has become another key point for the further historical development of human civilization.

Another example of AI, which officially received a set of civil rights, became Shibuya Mirai [26] - a chatbot in the messaging app Line, which is programmed to conduct seven year old boy. In the 2017, this artificial intelligence received a place in the real registry and an official residence in the Tokyo district of Shibuya with a population of about 224,000 people, Japan.

Because of the ever-expanding areas of artificial intelligence use in the life of human society, we can say that there is a tendency of development in the near future a kind of “Charter of Rights of Robots and AI”. Otherwise, the collapse of civil human rights can begin.

If we are somewhat deviate from the question of degree and completeness of the civil rights of robots and pay attention to the ever-widening sphere highly specialized applications of artificial intelligence in the socio-economic sector, then, along with numerous positive examples of its use, we have already begun to emerge and the negative impact of decisions made by the artificial intelligence in the sphere of the human rights of vulnerable groups of the population in developed countries [27].

### Conclusions.

In general, as we can see from history, many technological inventions that originally appeared in the works of the science fiction genre have become a reality these days. However, with regard to human rights, robots and artificial intelligence, should be aware that “no matter how much we value the experience and knowledge of individual scientists, they will almost always behave in accordance with the values of the societies in which they work. Virtually any study can create dual use - potential risks and benefits [28].”

By and large, most of the history of mankind is the history of the development of societies in terms of wars, conflicts, inventions and the use of weapons and military technologies. We think that the bombing of Hiroshima and Nagasaki in 1945 made many scientists seriously think about their responsibility for their inventions to society and future generations. The aforementioned sir T.J.Berners-Lee noted that computer scientists have not only technical but also moral responsibility to society. [29] Nowadays many members of robotics and artificial intelligence companies demanded UN to include military robots in the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons, which entered into force in 1983 [30], but a lot of them simultaneously indicate that artificial intelligence has great potential for the benefit of humanity in many ways, provided that humanity will increase its intellectual potential, transforming positively in the future from the developed information society, where knowledge is a public value, into a high-tech deeply scientific non-conflict society.

In modern societies, there are practically no people who would not be involved in information processes, because everyone produces, transmits and uses information every day. Beginning in the 1970s, progress on the scale of information consumption by society began to accelerate every year. Thanks to modern IT-technologies and technology, this process has become too rapid over the last decade. The transition to the global information society under the influence of digital information technology is still happening as a result of the uneven socio-economic development of different countries, but now we must understand that history does not forgive the lack of the ability to analyze the information that supplied.

### References

1. Autonomous Weapons: An Open Letter From AI And Robotics Researchers (July 28, 2015) // Access mode: <https://futureoflife.org/open-letter-autonomous-weapons/?cn-reloaded=1> - Title from the screen.
2. Gennadiy Mikhaylovich Dobrov (1929-1989): Bibliogr. ukaz. / Avt. predisl., vstup. st. i sost. O.I. Voverene, M.V. Vasina; Otv. red. M.G. Dobrov.- Kiyev: Nauk. dumka, 1990. - 44 s.; Dobrov G.M. Prognozirovaniye nauki i tekhniki. - M.: Nauka, 1977. - 209 s.; Dobrov G.M. Nauka: informatsiya i upravleniye (Informatsionnyye problemy upravleniya naukoy) / G.M.Dobrov, A.A.Korennoy. - M.: Sovetskoye radio, 1977. - 256 s.; Dobrov G.M. Kaputologiya, ili prikladnoy sistemnyy analiz neudach // Dobrov Gennadiy Mikhaylovich (1929-1989): Zb. - 2-ge vid., pererob. i dop. / Vidp. red. B. A. Malits'kiy. - K.: Feniks, 2004. - C. 81-127.; Malits'kiy B.A. Formuvannya ta yevolyutsiya naukoznavchoi shkoli Dobrova / B.A.Malits'kiy, M.V.Vasina // Nauka ta naukoznavstvo. - 1998. - № 4. - S. 8-11.; Malits'kiy B. A., Khranov YU. O. G. M. Dobrov - ucheniy ta uchitel' (do 80-richchya vid dnya narodzhennya) // Nauka ta naukoznavstvo.- 2009.- № 1. -S. 3-8.
3. Dobrov G.M. Nauka o nauke: Vvedeniye v obshcheye naukovedeniye. 3-ye izd., dop. i pererab. - Kiyev: Nauk. dumka, 1989. - 304 s.
4. Semenyuk E.P. K formirovaniyu nauki ob informatsii // NTI. Ser.1.Organizatsiya i metodika informatsionnoy raboty. - 1971. - S.5-13.; Semenyuk E.P. Informatsionnyy podkhod k poznaniyu deystvitel'nosti. - K.: Naukova dumka, 1988. - 238 s.; Semenyuk E.P. Razvitiye informatsionnogo prostranstva i progress obshchestva // NTI. Ser.1.Organizatsiya i metodika informatsionnoy raboty. - 1997. - S.1-12.; Semenyuk E. P. Informatsiya i nauchno-tekhnicheskiy progress kak faktory globalizatsii // NTI. Ser.1.Organizatsiya i metodika informatsionnoy raboty. - 2006. - S.1-12.; Semenyuk E. P.
5. Globalization of the information area and its significance for mankind // Scientific and Technical Information Processing. V.42/1. - 2015. - P. 1-12.; Semenyuk E. P. Man and information in the mirror of science: Past, present, and future // Scientific and Technical Information Processing. V.45/1. - 2018. - P.1-13.
6. Khomenko L.G. Istoriya otechestvennoy kibernetiki i informatiki (Etapy nakopleniya nauchnogo naslediya i opyta informatizatsii obshchestva) / L. G. Khomenko; NAN Ukrainy. In-t kibernetiki im. V.M.Glushkova. - K., 1998. - 454 c.; Khomenko L.H. Elektronna informatsiyna tsyvilizatsiya: dosvid rozbudovy v Ukraini: Monohr. / L. H. Khomenko. - K.: Mizhnar. ahentsiya "VeeZone", 2004. - 201 s.
7. Dubov D.V. Informatsiynye suspil'stvo v Ukraini: global'ni vyklyky ta natsional'ni mozhlyvosti / D.V. Dubov, M.A.Ozhevan, S.L.Hnatyuk/ Dopovid' do zasidannya «kruhloho stolu» 14 hrudnya 2010 r. - K., NISD, 2010.- 64 s.
8. Harari Y. N. (2016) Homo Deus: A Brief History of Tomorrow. - Harvill Secker, 2016. - 448 p.
9. Dubov D.V. Informatsiynye suspil'stvo... - Vkazana pratsya.
10. Shannon C.E. (1948) A Mathematical Theory of Communication // Access mode: <http://math.harvard.edu/~ctm/home/text/others/shannon/entropy/entropy.pdf> - Title from the screen.
11. Hilbert M., López P. (2011) The World's Technological Capacity to Store, Communicate, and Compute Information // Access mode: <http://www.ris.org/uploadi/editor/13049382751297697294 Science-2011-Hilbert-science.1200970.pdf> - Title from the screen.
12. Pershyy sayt u sviti // Rezhym dostupu: <https://www.w3.org/History/19921103-hypertext/hypertext/WWW/News/9201.html>
13. Castells M. (2014) The Impact of the Internet on Society: A Global Perspective // Access mode: [https://www.bbvaopenmind.com/en/articles/the-impact-of-the-internet-on-society-a-global-perspective/?utm\\_source=views&utm\\_medium=article07&utm\\_content=Internet-society-](https://www.bbvaopenmind.com/en/articles/the-impact-of-the-internet-on-society-a-global-perspective/?utm_source=views&utm_medium=article07&utm_content=Internet-society-) Title from the screen.
14. Viner N. Kibernetika, ili Upravleniye i svyaz' v zhyvotnom i mashine / Per. s angl. I.V. Solov'yeva i G.N. Povarova; Pod red. G.N. Povarova. - 2-ye izdaniye. - M.: Nauka, 1983. - 344 s.
15. Hebb D.O. The Organization of Behavior: A Neuropsychological Theory. - Taylor & Francis, 2002. - 378 p.
16. Minskiy M., Peyper S. Perseptrony /M.Minskiy, S.Peyper/ Per.s angl. - M.: Mir, 1971. - 262 s.
17. 16.The Universal Declaration of Human Rights (UDHR) (December 10, 1948) // Access mode: [https://undocs.org/ru/A/RES/217\(III\)](https://undocs.org/ru/A/RES/217(III)); International Covenant on Civil and Political Rights (December 16, 1966) // <https://www.ohchr.org/en/professionalinterest/pages/ccpr.a>

- spx - Title from the screen.; Treaty of Lisbon ( December 13, 2007) // Access mode: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A12007L%2FTXT> - Title from the screen.
18. Shcho take prava lyudyny? // Rezhym dostupu: <https://www.coe.int/uk/web/compass/what-are-human-rights> - Zaholovok z ekranu.
  19. Hamlin R. Civil rights // Access mode: <https://www.britannica.com/topic/civil-rights> - Title from the screen.
  20. Sapytska O.M. G.M. Dobrov as the founder of the national school of mathematical and machine methods of processing historical information / O.M. Sapitskaya // Scientific view of youth: key issues of the modern stage of the reform of the domestic legislation: Materials of the All-Ukrainian Scientific and Practical Conference of Students, Postgraduates and Young Scientists (December 13-14, 2018, Severodonetsk). Part 2. / Ed. prof. Rozovsky BG - Severodonetsk: the kind of SNU them V. Dahl 2019. - 240 p. - P.228-232.
  21. Robot // Access mode: <https://en.oxforddictionaries.com/definition/robot> - Title from the screen.
  22. Do we need Asimov's Laws? (May 16, 2014) // Access mode: <https://www.technologyreview.com/s/527336/do-we-need-asimovs-laws/> - Title from the screen.
  23. John McCarthy's Home Page // Access mode: <https://web.archive.org/web/20131011125002/http://www-formal.stanford.edu/jmc/> - Title from the screen.
  24. Artificial Intelligence // Access mode: [https://en.oxforddictionaries.com/definition/artificial\\_intelligence](https://en.oxforddictionaries.com/definition/artificial_intelligence) - Title from the screen.
  25. Statement on Visit to the USA, by Professor Philip Alston, United Nations Special Rapporteur on extreme poverty and human rights (Washington, December 15, 2017) // Access mode: <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=22533&LangID=E> - Title from the screen.
  26. Griffin A. Saudi Arabia Grants Citizenship To A Robot For The First Time Ever (October 26, 2017) // Access mode: <https://www.independent.co.uk/life-style/gadgets-and-tech/news/saudi-arabia-robot-sophia-citizenship-android-riyadh-citizen-passport-future-a8021601.html> - Title from the screen.
  27. Cuthbertson A. Tokyo: Artificial Intelligence 'Boy' Shibuya Mirai Becomes World's First Ai Bot To Be Granted Residency (November 6, 2017) // Access mode: <https://www.newsweek.com/tokyo-residency-artificial-intelligence-boy-shibuya-mirai-702382> - Title from the screen.
  28. Eubanks V. Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor. - St. Martin's Press, 2018. - 272 p.
  29. Herrlich P. The responsibility of the scientist (August 13, 2013) // Access mode: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3790058/> - Title from the screen.
  30. Berners-Lee T.J., Fischetti M. Weaving the Web: Origins and Future of the World Wide Web. - Texere Publishing, 1999.
  31. Gibbs S. Elon Musk leads 116 experts calling for outright ban of killer robots (August 20, 2017) // Access mode: <https://www.theguardian.com/technology/2017/aug/20/elon-musk-killer-robots-experts-outright-ban-lethal-autonomous-weapons-war> - Title from the screen.

## Література

1. Autonomous Weapons: An Open Letter From AI And Robotics Researchers (July 28, 2015) // Access mode: <https://futureoflife.org/open-letter-autonomous-weapons/?cn-reloaded=1> - Title from the screen.
2. Геннадий Михайлович Добров (1929-1989): Библиогр. указ. / Авт. предисл., вступ. ст. и сост. О.И. Воверене, М.В. Васина; Отв. ред. М.Г. Добров.- Киев: Наук. думка, 1990. - 44 с.; Добров Г.М. Прогнозирование науки и техники. - М.: Наука, 1977. - 209 с.; Добров Г.М. Наука: информация и управление (Информационные проблемы управления наукой) / Г.М.Добров, А.А.Коренной. - М.: Советское радио, 1977. - 256 с.; Добров Г.М. Капутология, или прикладной системный анализ неудач // Добров Геннадий Михайлович (1929-1989): 3б. - 2-ге вид., перероб. і доп. / Відп. ред. Б. А. Маліцький. - К.: Фенікс, 2004. - С. 81-127.; Маліцький Б.А. Формування та еволюція наукознавчої школи Доброва / Б.А.Маліцький, М.В.Васіна // Наука та наукознавство. - 1998. - № 4. - С. 8-11.; Маліцький Б. А., Храмов Ю. О. Г. М. Добров - учений та учитель (до 80-річчя від дня народження) // Наука та наукознавство.- 2009.- № 1. -С. 3-8.
3. Добров Г.М. Наука о науке: Введение в общее науковедение. 3-е изд., доп. и перераб. - Киев: Наук. думка, 1989. - 304 с.
4. Семенюк Э.П. К формированию науки об информации // НТИ. Сер.1.Организация и методика информационной работы. - 1971. - С.5-13.; Семенюк Э.П. Информационный подход к познанию действительности. - К.: Наукова думка, 1988. - 238 с.; Семенюк Э.П. Развитие информационного пространства и прогресс общества // НТИ. Сер.1.Организация и методика информационной работы. - 1997. - С.1-12.; Семенюк Э. П. Информация и научно-технический прогресс как факторы глобализации // НТИ. Сер.1.Организация и методика информационной работы. - 2006. - С.1-12.; Semenyuk E. P.
5. Globalization of the information area and its significance for mankind // Scientific and Technical Information Processing. V.42/1. - 2015. - P. 1-12.; Semenyuk E. P. Man and information in the mirror of science: Past, present, and future // Scientific and Technical Information Processing. V.45/1. - 2018. - P.1-13.
6. Хоменко Л.Г. История отечественной кибернетики и информатики (Этапы накопления научного наследия и опыта информатизации общества)/ Л. Г. Хоменко; НАН Украины. Ин-т кибернетики им. В.М.Глушкова. - К., 1998. - 454 с.; Хоменко Л.Г. Електронна інформаційна цивілізація: досвід розбудови в Україні: Моногр. / Л. Г. Хоменко. - К.: Міжнар. агенція "BeeZone", 2004. - 201 с.
7. Дубов Д.В. Інформаційне суспільство в Україні: глобальні виклики та національні можливості / Д.В. Дубов, М.А.Ожеван, С.Л.Гнатюк/ Доповідь до засідання «круглого столу» 14 грудня 2010 р. - К., НІСД, 2010.- 64 с.
8. Harari Y. N. (2016) Homo Deus: A Brief History of Tomorrow. - Harvill Secker, 2016. - 448 p.
9. Дубов Д.В. Інформаційне суспільство...- Вказана праця.
10. Shannon C.E. (1948) A Mathematical Theory of Communication // Access mode: <http://math.harvard.edu/~ctm/home/text/others/shannon/entropy/entropy.pdf> - Title from the screen.
11. Hilbert M., López P. (2011) The World's Technological Capacity to Store, Communicate, and Compute Information // Access mode:

- <http://www.ris.org/uploads/editor/13049382751297697294-Science-2011-Hilbert-science.1200970.pdf> - Title from the screen.
12. Перший сайт у світі // Режим доступу: <https://www.w3.org/History/19921103-hypertext/hypertext/WWW/News/9201.html>
  13. Castells M. (2014) The Impact of the Internet on Society: A Global Perspective // Access mode: [https://www.bbvaopenmind.com/en/articles/the-impact-of-the-internet-on-society-a-global-perspective/?utm\\_source=views&utm\\_medium=article07&utm\\_content=Internet-society-](https://www.bbvaopenmind.com/en/articles/the-impact-of-the-internet-on-society-a-global-perspective/?utm_source=views&utm_medium=article07&utm_content=Internet-society-) Title from the screen.
  14. Винер Н. Кибернетика, или Управление и связь в животном и машине / Пер. с англ. И.В. Соловьева и Г.Н. Поварова; Под ред. Г.Н. Поварова. – 2-е издание. – М.: Наука, 1983. – 344 с.
  15. Hebb D.O. The Organization of Behavior: A Neuropsychological Theory. - Taylor & Francis, 2002. - 378 p.
  16. Минский М., Пейпер С. Перцептроны /М.Минский, С.Пейпер/ Пер.с англ. - М.: Мир, 1971. - 262 с.
  17. 16.The Universal Declaration of Human Rights (UDHR) (December 10, 1948) // Access mode: [https://undocs.org/ru/A/RES/217\(III\);](https://undocs.org/ru/A/RES/217(III);) International Covenant on Civil and Political Rights (December 16, 1966) // <https://www.ohchr.org/en/professionalinterest/pages/ccpr.aspx> - Title from the screen.; Treaty of Lisbon ( December 13, 2007) // Access mode: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A12007L%2FTXT-> Title from the screen.
  18. Що таке права людини? // Режим доступу: <https://www.coe.int/uk/web/compass/what-are-human-rights-> Заголовок з екрану.
  19. Hamlin R. Civil rights // Access mode: <https://www.britannica.com/topic/civil-rights> - Title from the screen.
  20. Сапицька О.М. Г.М. Добров як засновник вітчизняної школи математичних і машинних методів обробки історичної інформації / О.М. Сапицька // Науковий погляд молоді: ключові питання сучасного етапу реформування системи вітчизняного законодавства: Матеріали Всеукраїнської науково-практичної конференції студентів, аспірантів та молодих науковців (13-14 грудня 2018 р., м. Северодонецьк). Частина 2. / За ред. проф. Розовського Б.Г. – Северодонецьк: вид-во СНУ ім. В. Даля. 2019. – 240 с. – С.228-232.
  21. Robot // Access mode: <https://en.oxforddictionaries.com/definition/robot> - Title from the screen.
  22. Do we need Asimov's Laws? (May 16, 2014) // Access mode: <https://www.technologyreview.com/s/527336/do-we-need-asimovs-laws/> - Title from the screen.
  23. John McCarthy's Home Page // Access mode: <https://web.archive.org/web/20131011125002/http://www-formal.stanford.edu/jmc/> - Title from the screen.
  24. Artificial Intelligence // Access mode: [https://en.oxforddictionaries.com/definition/artificial\\_intelligence](https://en.oxforddictionaries.com/definition/artificial_intelligence) - Title from the screen.
  25. Statement on Visit to the USA, by Professor Philip Alston, United Nations Special Rapporteur on extreme poverty and human rights (Washington, December 15, 2017) // Access mode: <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=22533&LangID=E> - Title from the screen.
  26. Griffin A. Saudi Arabia Grants Citizenship To A Robot For The First Time Ever (October 26, 2017) // Access mode: <https://www.independent.co.uk/life-style/gadgets-and-tech/news/saudi-arabia-robot-sophia-citizenship-android-riyadh-citizen-passport-future-a8021601.html> - Title from the screen.
  27. Cuthbertson A. Tokyo: Artificial Intelligence 'Boy' Shibuya Mirai Becomes World's First Ai Bot To Be Granted Residency (November 6, 2017) // Access mode: <https://www.newsweek.com/tokyo-residency-artificial-intelligence-boy-shibuya-mirai-702382> - Title from the screen.
  28. Eubanks V. Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor. - St. Martin's Press, 2018. – 272 p.
  29. Herrlich P. The responsibility of the scientist (August 13, 2013) // Access mode: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3790058/> - Title from the screen.
  30. Berners-Lee T.J., Fischetti M. Weaving the Web: Origins and Future of the World Wide Web. - Texere Publishing, 1999.
  31. Gibbs S. Elon Musk leads 116 experts calling for outright ban of killer robots (August 20, 2017) // Access mode: <https://www.theguardian.com/technology/2017/aug/20/elon-musk-killer-robots-experts-outright-ban-lethal-autonomous-weapons-war> - Title from the screen.

#### **Сапицька О.М. До історії впливу ІТ-технологій на становлення та розвиток сучасного інформаційного суспільства**

*Людський універсум у своєму розвитку пройшов через декілька етапів цивілізаційних перетворень. Кожний з цих етапів характеризується набором власних ознак, котрі безпосередньо впливали на якість життя соціуму, а відтак, на всі аспекти буття як на мікро-, так і на макрорівні, якщо розглядати існування та функціонування соціальних та політичних організмів, як систему. Технологічні інновації практично завжди протягом дослідженої історії в будь-якому суспільстві відбивали соціальні цінності, котрі, в свою чергу, трансформували суспільство в тій чи іншій мірі. Поява машинних методів обробки інформації вплинули на швидку трансформацію сучасного суспільства з індустріального на постіндустріальне інформаційне.*

*У статті коротко описані ключові моменти появи фундаментальних машинних методів обробки інформації та цифрових технологій, що вплинули на становлення сучасного інформаційного суспільства та його функціонування у всіх аспектах життєдіяльності в умовах загальної повсякденної доступності та впливу великого масиву інформації.*

**Ключові слова:** цивілізаційна трансформація, інформаційне суспільство, ІТ-технології, роботи, штучний інтелект, машинні методи обробки інформації

#### **Сапицкая Е.М. К истории влияния ИТ-технологий на становление и развитие современного информационного общества**

*Человеческий универсум в своем развитии прошел через несколько этапов цивилизационных преобразований. Каждый из этих этапов характеризуется набором собственных признаков, которые непосредственно влияли на качество жизни социума, а значит, на все аспекты бытия как на микро-, так и на макроуровне, если рассматривать существование и функционирование социальных и политических организмов, как систему. Технологические инновации практически всегда на протяжении исследованной истории в любом обществе отражали социальные ценности, которые, в свою очередь, изменяли общество в той или иной степени. Появление машинных методов обработки информации повлияло на быструю трансформацию современного общества с индустриального на постиндустриальное информационное.*

*В статье кратко описаны ключевые моменты появления фундаментальных машинных методов обработки информации и цифровых технологий, повлиявших на становление современного информационного общества и его функционирования во всех аспектах жизнедеятельности в условиях повседневного влияния большого массива информации.*

**Ключевые слова:** *цивилизационная трансформация, информационное общество, IT-технологии, роботы, искусственный интеллект, машинные методы обработки информации*

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Стаття подана 12.05.2019.