Marcin Kowalczyk

University of Warmia and Mazury in Olsztyn, Poland

marcin.kowalczyk@uwm.edu.pl

ORCID ID: 0000-0003-2900-1464

SOCIAL ASPECTS OF ARTIFICIAL INTELLIGENCE – SELECTED ISSUES

Abstract

The paper presents findings regarding AI and Machine Learning and how "thinking machines" differ from human beings? In the next part the paper presents the issue of AI and Machine Learning's impact on day-to-day activities in the following areas: 1. Microtargetting and psychometrics – with the examples from the business and politics; 2. Surveillance systems, biometric identification, COVID 19 tracing apps etc. – the issue of privacy in the digital era; 3. The question of choice optimization (AI-driven Web browsers and dating apps, chatbots and virtual assistants etc.); whether free will still exist in the AI supported on-line environment? The article is summed up with conclusions.

Keywords: *Artificial Intelligence (AI), Machine Learning (ML), microtargetting, psychometrics, surveillance systems, biometric identification, COVID-19 tracing apps, privacy, chatbots, virtual assistants*

Introduction

The aim of the article is to discuss selected issues related to the social aspects of the use of algorithms (Artificial Intelligence – AI and Machine Learning – ML) and to indicate potential benefits and threats related to AI and ML. The article highlights some selected research problems. The first research problem relates to the identification of the potential dangers of micro-targeting and psychometrics – including the use of these tools by selected bigtech companies and political consultants in important election campaigns. Another research

problem is depicted in the question: is it possible to maintain privacy in the era of the fourth industrial revolution? In this case, selected applications of algorithmic systems e.g. in mobile tracing applications, identifying cases of COVID-19 virus infections, as well as biometric identification systems and surveillance systems will be discussed. The last research problem analyzed in the article relates to issues of choice optimization with the support of algorithmic systems; the choice relating to both the positioning of selected content in web browsers and the use of support from virtual assistants in even very serious life decisions related to, for example, choosing potential partner. In this case, it is reasonable to ask the question: does free will still exist in the network environment supported by algorithmic systems? The presented research problems will be thoroughly characterized in the following parts of the article.

Defining Artificial Inteligence (AI) and Machine Learning (ML) – literature review

To begin with, a brief description of Artificial Intelligence and Machine Learning should be presented in this part of the paper, The differences in algorithmic systems and artificial neural networks compared to the human brain should also be discussed. According to Pedro Domingos, AI relates to teaching computers to do things that people do better today. Domingos assumes that learning is the most important component of this process, since without learning, no computer would be able to keep up with people[1]. Referring to Machine Learning, Domingos believes that it should be treated as a sub-field of AI, and not a concept synonymous with AI[2].

The theoretical framework related to the Artificial Intelligence system was presented in 1965 by the British mathematician Irving John Good. He defined an ultra-intelligent machine as: "machine that can far surpass All of the intellectual activities of Any man however clever. Since the design of machines is one of these intellectual activities, an ultraintelligent machine

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[1] P. Domingos, *The Master Algorithm. How the quest for the Ultimate Learning Machine Will Remake Our World*, Penguin Random House, UK, 2015, p. 8.
[2] *Ibidem*, p. 8.

could design even better machines; there would then unquestionably be an "intelligence explosion," and the intelligence of man would be left far behind. Thus the first ultraintelligent machine is the last invention that man need ever make, provided that the machine is docile enough to tell us how to keep it under control"[3].

The concept of an ultra-intelligent machine is associated with the definition of a test, proposed by Alan Turing, a British mathematician responsible for breaking the codes in the Enigma apparatus, used by the Nazis during World War II. In 1950, Alan Turing proposed an operational definition of Artificial Intelligence, assuming that the study would indicate not so much whether a machine is capable of thinking, but whether it is capable of behaving like a human being. The Turing test was supposed to be a real-time machine-human conversation; man's task was to judge whether he/she was communicating with a machine or with another human being. The system would pass the Turing Test if, in at least 30% of the cases, the evaluators would not be able to indicate that they are dealing with a machine – then the system could be considered to be intelligent[4].

In addition to the Turing Test mentioned above, there are a few more examples of tests, which indicate whether people are dealing with an intelligent machine:

- Wozniak's test – a test assuming that a robot is intelligent if it can enter an average home and make a coffee for itself[5];
- Goertzel's test – a test assuming that the system is intelligent if it can enroll in studies, take and pass subjects, and obtain a diploma[6];

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[3] I. J. Good, *Speculations concerning the First Ultraintelligent Machine*, [in:] *Advances in Computers*, edited by Franz L. Alt and Morris Rubinoff, Volume 6, New York Academic Press, p. 33; http://chasewoodford.com/resources/ebooks/Speculations_Concerning_The_First_Ultraintelligent_Machine.pdf, access: 7.29.2021.

[4] A. M. Turing, *Computing Machinery and Intelligence*, Mind, nr LIX(236), p. 433–460, https://academic.oup.com/mind/article-pdf/LIX/236/433/9866119/433.pdf; access: 7.29.2021.

[5] M. Schick, *Wozniak: Could a Computer Make a Cup of Coffee?*, Fast Company, 02.03.2010, https://www.fastcompany.com/1568187/wozniak-could-computer—make-cup-coffee; access: 7.29.2021.

[6] B. Goertzel, *What Counts as a Conscious Thinking Machine?* New Scientist, 5.09.2012, https://www.newscientist.com/article/mg21528813-600-what-counts-as-a-conscious-thinking-machine/; access: 7.29.2021.

- Nillson's test – a test that could prove that a system is intelligent if it can work just as well or better than a human in an economically significant workplace[7].

According to Stuart J. Russell and Peter Norvig, an intelligent system should have the following characteristics. First of all, it should be capable of conducting natural language processing, i.e. the ability of receiving, interpreting and creating statements in any form (sound or text). The system should also be able to represent knowledge, that is collecting and storing information and generated knowledge. In addition, it should be capable of performing automated reasoning – defined as the use of information resources (based on identified patterns) in order to obtain answers to the questions posed to the system and to draw completely new conclusions. Russell and Norvig describe Machine Learning as the ability to intelligently adapt to new circumstances as well as identify patterns in order to learn, based on previous experience. An intelligent system should also be capable of conducting image analysis (computer vision), i.e. recognition and identification of the physical arrangement of objects. The last feature of an intelligent system should be robotics, i.e. the ability to conduct interaction with the environment and movement[8].

Machine Learning, as defined by Arthur L. Samuel, is a field of science in which research focuses on obtaining by computers the ability to learn without the need to receive programming code[9]. According to Tom Mitchell, the Machine Learning process is described by the following sentence (referring to an exemplary game of checkers): "A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at tasks in T, as measured by P, improves with experience E"[10]. When defining Machine Learning, Max Tegmark focuses mainly on

7   N . J. Nillson, *Human-Level Artificial Intelligence? Be Serious!*, AI Magazine, Vol. 26 No 4: Winter 2005, p. 68–75, https://www.aaai.org/ojs/index.php/aimagazine/article/view/1850/1748; access: 7.29.2021.

8   S. J. Russell, P. Norvig, *Arti ficial Intelligence A Modern Approach Third Edition*, Pearson Education, Inc., Upper Saddle River, New Jersey, USA, 2010, p. 2-3, https://cs.calvin.edu/courses/cs/344/kvlinden/resources/AIMA-3rd-edition.pdf; access: 7.29.2021.

9   A. L. Samuel, *Some Studies in Machine Learning Using the Game of Checkers*, IBM Journal of Research and Development, Volume: 3, Issue: 3, July 1959, s. 210–229, http://www2.stat.duke.edu/~sayan/R_stuff/Datamatters.key/Data/samuel_1959_B-95.pdf; access: 7.29.2021.

10 T. M . Mitchell, *Machine Learning*, McGraw-Hill Science/Engineering/Math, New York, USA, 1997, p. 2, https://www.cin.ufpe.br/~cavmj/Machine%20-%20Learning%20-%20Tom%20Mitchell.pdf, access: 29.7.2021.

artificial neural networks that are supposed to imitate the network of nerve connections in the human brain. In his view, it is the interest in neural networks that has a very strong impact on the area of research both on natural human intelligence and Artificial Intelligence, and in a narrower sense – one of its subdisciplines, referred to as Machine Learning, i.e. the study of algorithms that improve through experience[11]. According to Mariette Award and Rahul Khanna "Machine Learning (ML) is a branch of Artificial Intelligence that systematically applies algorithms to synthesize the underlying relationships among data and information. For example, ML systems can be trained on automatic speech recognition systems (such as iPhone's Siri) to convert acoustic information in a sequence of speech data into semantic structure expressed in the form of a string of words"[12].

Thinking machines

Among the practical examples of advances in machine learning, Max Tegmark mentions, Deep Blue – system designed by IBM, which in 1997 defeated grandmaster Garri Kasparov in a game of chess (in fact, it was an effect of the possibility of collecting large amounts of data by a computer system). As Tegmark noted: "key reason that Deep Blue could outplay its creators was its ability to compute faster and thereby analyze more potential positions"[13] Another project created by programmers from IBM – Watson should be considered in a similar way. In 2011, Watson, using a Machine Learning system, was able to become proficient in competing in the *Jeopardy* game show, by defeating two of its best players from one edition (including Ken Jenning, a 74-time game show winner) – Tegmark believes that Watson "too relied less on learning than on custom-programmed skills and superior memory and speed"[14]. in June 2014, on the 60th anniversary of Alan Turing's suicidal passing, the Turing Test was organized with the participation of selected experts

[11] M. Tegmark, *Life 3.0 Being Human in the Age of Artificial Intelligence*, Penguin Random House, UK, 2017, p. 72.
[12] M. Award, R. Khanna, *Efficient Learning Machines*, Apress open, 2015, p. 1, https://link.springer.com/content/pdf/10.1007%2F978-1-4302-5990-9.pdf, access: 7.29.2021.
[13] M. Tegmark, *Life 3.0…*, p. 78.
[14] *Ibidem*, p. 78.

who were to determine whether they were dealing with a chatbot imitating a teenager or a living human. The legendary Turing Test was passed for the first time in its history by a project by Princeton University scientists entitled Eugene Goostman (referring to the name of a chatbot imitating a fictional 13-year-old from Odessa). 33% of the jurors were convinced that they were chatting online with a living person[15]. Another major AI success relates to the winning go game playing application created by Google – DeepMind Alpha Go. In March 2016, DeepMind Alpha Go defeated South Korean go grandmaster Lee Sedol[16].

Despite these successes, algorithmic systems still cannot accurately mimic the functions of the human brain. The main differences between human beings and "thinking machines" are listed below:

- Human brain – the most important, high energy-consuming human organ (around 20 per cent of body oxygen consumption)[17] – high energy cost of "erasing" (forgetting) previously obtained data;
- Emotional sphere – algorithms cannot define moral values, they are not driven by greed. AI doesn't have the same moral dillemas as human beings (even though some researchers try to tackle the issue of robot morality)[18];

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[15] D. Aamoth, *Interview with Eugene Goostman, the Fake Kid Who Passed the Turing Test*, Time, June 9, 2014, http://time.com/2847900/eugene-goostman-turing-test/, access: 7.29.2021.

[16] *The Google DeepMind challenge match*, https://deepmind.com/alphago-korea; access: 7.29.2021.

[17] R. G. Shulman et al., *Energetic basis of brain activity: implications for neuroimaging*, Trends in neurosciences, Volume 27, Issue 8, 1 August 2004, p. 489-495, https://www.sciencedirect.com/science/article/abs/pii/S0166223604001894; access: 7.29.2021.

[18] K. Martin, *Ethical Implications and Accountability of Algorithms*, Journal of Business Ethics, 160 (2019), p. 835-850, https://link.springer.com/article/10.1007/s10551-018-3921-3; access: 7.29.2021; E. Stamboliev, *Challenging Robot Morality: An Ethical Debate on Humanoid Companions, Dataveillance, and Algorithms*, University of Plymouth, 2019, https://pearl.plymouth.ac.uk/handle/10026.1/14295; access: 7.29.2021.

- Heuristics – human brain is aimed at finding patterns. Side effects: risk-assessment and prediction analysis misjudgement (wishful thinking, "Greed is good" ethics)[19].

Problematic issues

A. Microtargetting and psychometrics

The first problematic area regarding the potential adverse effects of AI on humans relates to the possible use of micro-targeting and content personalization techniques. In the business world, it is an increasingly widespread strategy to optimize costs and time while providing products and services tailored to individual customer tastes. The pioneer of the use of machine learning in content positioning is the giant of digital entertainment – Netflix streaming platform. In 2006, Netflix launched an open *Netflix Prize* competition with a $ 1 million grand prize. The aim of the competition was to select the best projects to improve the correctness of the predictions of the future rating of the selected movie or series, using an algorithm that analyzes previously watched contents, and the preferences indicated by the user relating to the favorite titles or genres of films selected previously[20]. Currently, Netflix has one of the most successful and profitable productions (both movies and series), with record-breaking revenues. Netflix's net profit for the second quarter of 2021 amounted to $ 1.353 billion (an increase of 87.87% compared to the previous year's data; profit from year to year is steadily increasing)[21].

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[19] R. A. Bettis, S. Hu, *Bounded Rationality, Heuristics, Computational Complexity, and Artificial Intelligence*, Behavioral Strategy in Perspective, (*Advances in Strategic Management, Vol. 39*), Emerald Publishing Limited, Bingley, p. 139-150, https://www.emerald.com/insight/content/doi/10.1108/S0742-332220180000039010/full/html; access: 7.29.2021; Z. Lou, M. Yin, *Human Reliance on Machine Learning Models When Performance Feedback is Limited: Heuristics and Risks*, CHI'21 Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems, May 2021, Article No. 78, p. 1-16, https://dlacm.org/doi/abs/10.1145/3411764.3445562; access: 7.29.2021.

[20] *Netflix Prize*, https://www.netflixprize.com/index.html; access: 7.29.2021; *Netflix Prize: Forum*, https://www.netflixprize.com/community/topic_1537.html; access: 7.29.2021.

[21] *Netflix Net Income 2006-2021|NFLX*, macrotrends, https://www.macrotrends.net/stocks/charts/NFLX/netflix/net-income; access: 7.29.2021.

Netflix is an example of a bigtech company generating substantial revenues from innovation in the form of Machine Learning[22]…

Algorithms can also be used by political consultants. In June 2016, the AI supported tools were used by Cambridge Analytica in profiling the recipients of election announcements related to the EU Leave campaign in the Brexit referendum. In this case, Facebook users were heavily profiled[23]. On the other side of the Atlantic Ocean, in the months before November 2016, Cambridge Analytica undertook the same type of activities in profiling Facebook users who could be potential voters of Donald Trump in the upcoming presidential election[24]. Ujawnienie faktu wykorzystania danych 50 milionów użytkowników Facebooka przyczyniło się do rozpoczęcia debaty dotyczącej konieczności zachowania prywatności użytkowników mediów społecznościowych[25]. As investigative media uncovered the fact that the personal data of 50 million Facebook have leaked to be used by Trump campaigners, the debate on the need to maintain the privacy of social media users has been initiated promptly.

B. The issue of privacy in the digital era

With regard to the issue of privacy, it should be noted that data plays a huge role in the functioning of both enterprises and public institutions. Data can determine the success of a business project, making the company CEOs almost certain of the end result in the form of guaranteed profit. Bigtech companies from the GAFAM group (Google, Amazon, Facebook,

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[22] C. A. Gomez-Uribe, N. Hunt, *The Netflix Recommender System: Algorithms, Business Value, and Innovation*, ACM Transactions on Management Information Systems, Volume 6, Issue 4, January 2016, Article No.: 13, p. 1-19, https://dlacm.org/doi/abs/10.1145/2843948; access: 7.29.2021.

[23] L. Risso, *Harvesting Your Soul? Cambridge Analytica and Brexit*, Brexit Means Brexit? The Selected Proceedings of the Symposium, Akademie der Wissenschaften und der Literatur, Mainz 6–8 December 2017, ed. C. Jansohn, Akademie der Wissenschaften und der Literatur, Mainz, p. 75-87, https://www.adwmainz.de/fileadmin/user_upload/Brexit-Symposium_Online-Version.pdf#page=75; access: 7.29.2021.

[24] H. Grasseger, M. Krogerus, *The Data That Turned the World Upside Down*, Motherboard, January 28, 2017, https://www.vice.com/en/article/mg9vvn/how-our-likes-helped-trump-win; access: 7.29.2021.

[25] I. Kozlowska, *Facebook and Data Privacy in the Age of Cambridge Analytica*, The Henry M. Jackson School of International Studies, University of Washington, April 30, 2018, https://jsis.washington.edu/news/facebook-data-privacy-age-cambridge-analytica/; access: 7.29.2021.

Apple, Microsoft) treat data on an equal footing with financial capital. The privacy of the recipients of "free" digital content is becoming an interchangeable commodity, increasing the chances of success for the tech companies.

However, public institutions can also function in a similar way. A classic example of unauthorized use of citizens' data is the policy of Social Credit System implemented by the Chinese authorities[26]. The system rewards the desired actions of citizens and uses forms of severe punishments (such as banning from flying on planes or travelling by train) for non-compliance with these actions. Algorithms play important role in successful implementation of the Social Credit System in form of biometric identification made with the use of surveillance cameras[27]. According to the plans of the authorities, 300 million devices of this type were to be installed in China by the end of 2020[28] (according to some estimates, this number may even be more than twice larger – with over 600 million surveillance cameras installed[29]). AI is also used in mobile tracing applications, that identify possible contact with a person infected with the COVID-19 virus. China, like Singapore and South Korea, has achieved considerable success in fighting the first wave of the pandemic thanks to the use of mobile tracing apps[30].

Both in the case of the indicated commercial institutions and the actions of state authorities, the issue of privacy remains a very important problem. It is privacy that becomes an exchangeable commodity, thanks to which enterprises

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26 H. Krause Hansen, R. Weiskopf, *From Universalizing Transparency to the Interplay of Transparency Matrices: Critical insights from the emerging social credit system in China*, Organization Studies, Vol 42, Issue 1, 2021, https://journals.sagepub.com/doi/full/10.1177/0170840619878474; access: 7.29.2021; F. Liang et al., *Constructing a Data-Driven Society: China's Social Credit System as a State Surveillance Infrastructure*, Policy & Internet, Volume 10, Issue 4, Special Issue: Social Media and Big Data in China, December 2018, p. 415-453, https://onlinelibrary.wiley.com/doi/abs/10.1002/poi3.183; access: 7.29.2021.

27 Y. Wu et al., *Cooperation with Police in China: Surveillance Cameras, Neighborhood Efficacy and Policing*, Social Science Quarterly, Volume 102, Number 1, January 2021, https://onlinelibrary.wiley.com/doi/epdf/10.1111/ssqu.12903; access: 7.29.2021.

28 J. Glynn, *1984 in 2019 The New Privacy Threat from China's Social Credit Surveillance Systems*, Skeptic Magazine, Volume 24, Number 2, 2019, p. 38-41, https://www.survivorshandbook.com/wp-content/articles/china-1984.pdf; access: 7.29.2021.

29 N. Wouters, *Big Brother walks into an office …*, Artificial Intelligence for Better or Worse, Future Leaders, 2019, http://www.questions.com.au/echapters/pdf/Artificial-Intelligence/Niels-Wouters.pdf; access: 7.29.2021.

30 H. Cho et al., *Contact Tracing Mobile Apps for COVID-19: Privacy Considerations and Related Trade-offs*, arXivLabs, Cornell University, 30 March 2020, https://arxiv.org/pdf/2003.11511.pdf; access: 7.29.2021.

obtaining personal data can almost be certain of guaranteed profit[31]. The lack of privacy may also be the price of effective governance, with human rights not being taken into consideration – as in the case of China's Social Credit System.

C. The question of AI supported choice optimization

The third problematic issue concerns the influence of artificial intelligence on the choices which are made by billions of people on daily basis. Algorithmic systems can, for instance, support searching for information in web browsers – which could be based on user's previous searches[32]. This is a practical example related to the use of the semantic web – Web 3.0, personalized for the user. Virtual assistants[33] (such as Siri, Alexa, Cortana, Google Assistant, Bixby etc.) and chatbots[34] can also support people in their daily decisions. Artificial Intelligence may also play crucial role in areas as important as choosing a potential life partner. According to the results of research conducted by a team led by sociologist Michael Rosenfeld from Stanford University, in 2017, 39 percent of heterosexual couples in the USA have initiated relationship online (with a large share of dating apps being included in the statistics)[35].

The problem related to the use of the above-mentioned applications is foremostly about a narrowing choice, when obtaining information from the

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[31] S. Zuboff, *The age of surveillance capitalism: The fight for a human future at the new frontier of power*, New York: Public Affairs, 2018.

[32] S. Shyam Sundar, *Rise of Machine Agency: A Framework for Studying the Psychology of Human–AI Interaction (HAII)*, Journal of Computer-Mediated Communication, Volume 25, Issue 1, January 2020, p. 74–88, https://academic.oup.com/jcmc/article/25/1/74/5700811?login=true; access: 7.29.2021.

[33] D. Rafailidis, Y. Manolopoulos, *Can Virtual Assistants Produce Recommendations?* WIMS 2019: Proceedings of the 9th International Conference on Web Intelligence, Mining and Semantics, June 2019, Article No. 4, p. 1-6, https://dl.acm.org/doi/abs/10.1145/3326467.3326468; access: 7.29.2021.

[34] E. Adamopoulou, L. Moussiades, *Chatbots: History, technology, and applications*, Machine Learning with Applications, Volume 2, 15 December 2020, https://www.sciencedirect.com/science/article/pii/S2666827020300062; access: 7.29.2021.

[35] M. Rosenfeld et al., *Disintermediating your friends: How online dating in the United States displaces other ways of meeting*, Proceeding of the National Academy of Sciences of the United States of America, September 3, 2019 116 (36) p. 17753-17758, https://www.pnas.org/content/116/36/17753?utm_source=yxnews&utm_medium=desktop&utm_referrer=https://yandex.kz/news; access: 7.29.2021; A. Shashkevich, *Meeting online has become the most popular way U.S. couples connect, Stanford sociologist finds*, Stanford News, August 21, 2019, https://news.stanford.edu/2019/08/21/online-dating-popular-way-u-s-couples-meet/; access: 7.29.2021.

network (the phenomenon of the *echo chamber*, which does not allow to confront views different from the personalized content selected in terms of prior web search[36]. An issue of equal importance relates to the personal freedom – free will and the freedom to make spontaneous independent choices. Both dating applications and virtual assistants can narrow these choices down through an optimization strategy (e.g. selecting candidates for partners on the basis of a list of similarities, choosing one specific route when traveling by car, etc.)[37]. Relying too much on virtual assistants and gaining information from the web can also cause human beings to "unlearn" how to remember and store information on their own[38].

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[36] A. Bruns, *Echo chamber? What echo chamber? Reviewing the evidence*, 6th Biennial Future of Journalism Conference (FOJ17), 2017, https://eprints.qut.edu.au/113937/8/Echo_ Chamber.pdf; access: 7.29.2021; M. Cinelli et al., *The echo chamber effect on social media*, Proceeding of the National Academy of Sciences of the United States of America, March 2, 2021 118 (9) e2023301118, https://www.pnas.org/content/pnas/118/9/e2023301118.full. pdf; access: 7.29.2021.

[37] A Schmidt, T*he End of Serendipity: Will Artificial Intelligence Remove Chance and Choice in Everyday Life?*, CHItaly '21, July 11–13, 2021, Bolzano, Italy, https://uni.ubicomp.net/as/ as-chocie.pdf; access: 7.29.2021.

[38] N. Carr, *The Shallows: What the Internet Is Doing to Our Brains*, W. W. Norton, New York, NY:, 2010; N. Carr, *How Smartphones Hijack Our Minds*, Wall Street Journal, Oct. 6, 2017, https:// cs12.cs.qc.cuny.edu/~waxman/How%20Smartphones%20Hijack%20Our%20Minds%20 -%20WSJ.pdf; access: 7.29.2021.

Conclusion

The article should be summarized with a list of several questions that should be addressed in the coming years. These questions concern both the privacy of network users, the excessive growth of bigtech companies, as well as the potential threats that may result from the use of AI in shaping the public debate. The most important areas of the above-mentioned issues for further research are in the form of questions listed as follows:

- How to use data without losing privacy?
- How to use tech platforms without creating monopolies?
- How to use AI without losing control and democracy[39]?

A very serious issue for legislators in the coming years will be related to appropriate supervision over new technologies, including Artificial Intelligence and Machine Learning. It will be equally important to preserve privacy of recipients of digital content and to ensure compliance with the rule of law and survival of democracy, as it exists at the present.

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[39] Questions being formulated by Jim Hageman Snabe, Chairman of Siemens during the panel *Technology Governance Outlook*, Global Technology Governance Summit, Japan, April 6, 2021, https://www.weforum.org/events/global-technology-governance-summit-2021/sessions/technology-governance-outlook?utm_source=sfmc&utm_medium=email&utm_campaign=2743619_4ir-gtgs&utm_term=&emailType=Strategic%20Intelligence%20Update%e2%80%8b&ske=MDAxMFgwMDAwNG5lV2Y5UUFF; access: 7.29.2021.

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