PHISHING FOR PHOOLS 4.0

Zuzana Džbánková – Pavel Sirůček

Abstract

The modern world is marked by changes 4.0. The terms as Revolution 4.0, Industry 4.0, Work 4.0, Education 4.0, and so on, surround us. These are associated with the current phase of digitization and robotization in anticipation of the further groundbreaking technological revolution. Radical changes await not only labour markets, individual economies, and entire societies. Society 4.0 or even 5.0 are presented. The authors of the paper evoke several fundamental questions raised by the emergence of new technologies at the moral level. Whether it is rational to behave ethically in conditions of digital society 4.0? How new modern technology influences human values, and how does one change himself? What role does responsibility play in introducing modern technologies? Is there Ethics 4.0 or Machine Ethics as part of artificial intelligence? Over the past two decades, ethics has become a fashionable word, just like corporate social responsibility (CSR). Are they just the popular fashion themes for education and business or have a legitimate mission here? Are marketing practices of manipulation and deception compatible with ethics? The contribution draws on available sources and realities within the Czech Republic and the EU and critically evaluates technology i4.0 contradictory impacts on society

Key words: Industry 4.0, Ethic 4.0, Society 4.0

JEL Code: O 33, B 59, A13

Introduction

The so-called Fourth industrial revolution influences today's world. Concepts with magic „4.0“ surround us: industry 4.0, production 4.0, work 4.0, economy 4.0, science, technology and technology 4.0, education 4.0, culture 4.0, legislation 4.0, ethics and social responsibility 4.0, sport 4.0, digital society 4.0, initiatives, alliances, platforms, vision, strategy 4.0 etc. It means a groundbreaking digital revolution with complex digitization, robotization, and automation. The mythical “second era of machines” is intended to multiply not physical forces but mental ones, thereby helping fantastically to release the power of the human spirit and creativity (Brynjolfsson, McAfee, 2015). Expressions with 4.0 as the 4th Industrial

Revolution (4IR) or Industry 4.0 are examples of contemporary buzzwords[1]. Buzzwords 4.0 also includes cool terms such as AI, Big Data, Blockchain, Cloud Computing, CPS (Cyber-Physical Systems), disruptive, 3D Printing, Virtual Reality, IoT (Internet of Things), IoS (Internet of Services)), IoP (internet of people) or IoE (Internet of everything) etc. Originally a German marketing product 4IR[2] attracted the attention of the media, politicians, the public, academia and research, including forecasters. It is debated whether 4IR is a fundamental breakthrough in economic, and more socio-economic, development. However, other European companies and other countries gradually joined the project. A new phenomenon has emerged, which really stirs discussions and broadly arouses interest in the use of new technologies of automation, digitization or robotization. The main idea of the Industry 4.0 concept (the Průmysl 4.0 follow-up initiative here) is to computerize machines, products, people and other systems with a smart distributed network of entities along the entire value chain. These systems work autonomously and in parallel, using virtualization. CPS[3] is used, and robots and humans enter it as additional entities through a dedicated interface. The term society 4.0 is often considered synonymous with 4IR. Usually, it is in the sense of the summary designation of processes 4.0 with an emphasis on the complexity of changes and societal impacts, beyond the i4.0 framework (including, e.g. health 4.0). Not only futurologists speculate about a new socio-technological concept. Changes in the value chain are expected; shifts in the structure of consciousness, institution and capital flows are expected. But this implies new thinking, a new worldview, complex processes and systems. People must be prepared appropriately and adequately trained to think differently (Sirůček & Džbánková, 2017), (Sirůček, 2017). Therefore, education and willingness to educate as a continuous process and fostering creativity are crucial to grasping new opportunities and maintaining competitiveness. This also applies to the Czech Republic, which, given the structure of the industry, represents the fourth most threatened country in terms of labour by automation[4]. By 2030, up to 40 per cent of existing jobs could be lost here (PwC, 2018). The automation and introduction of new technologies generally raise a number of ethical questions about the consequences of these processes. The paper is a summary essay (original scientific review) which is not based on

[1]. The buzzword is a composite of English (word, buzz, buzz, buzz, chirp, but also chasing your head). It was first used in 1946 in student slang. It is a new, heavily fashionable and popular word. It often does not mean much (and most people do not understand it), but everyone is always talking about it. However, it can also indicate a radical new term that came into general awareness.

[2] the concept of Industry 4.0 (broadly 4IR or even Work 4.0) is based on a document that was presented at the 2013 Hannover Trade Fair, where the German platform Industrie 4.0 was officially launched

[3] Cyber-Physical Systems (CPS) are integrations of computation, networking, and physical processes.

[4]PricewaterhouseCoopers study analysed over 200,000 jobs in 29 developed countries to explore the economic benefits and potential challenges posed by automation.

original research. The authors focused on some moral consequences of 4IR. To achieve this goal have been used methods of description, comparison and qualitative analysis, using data from secondary sources of scientific literature and the results of research available on the topic.

1 Ethics of technology and economics

Although ethical[5] categories may seem to be outside economic and technical considerations, the moral dimension needs to be taken into account. All human activity is determined primarily by the social and cultural environment, within which experience and value system are formed. Man chooses not only on the basis of rationality, as assumed by standard economics, but also of values. The tradition of an ethical approach in economics (and law) is tied to the search for a just organization of society and as old as the first attempts to describe economic life. Throughout antiquity and the Middle Ages, economic considerations have been part of philosophy and moral philosophy, i.e. ethics. The reduction of economic thinking by the moral dimension is related to the efforts to describe and solve the real problems of the capitalist economic system and the independence of economics as a science, resp. with considerations of rational behaviour and later with axiomatization (Sirůček & Džbánková, 2006). The growing interest in the ethical dimension of the functioning of the economy is reappearing as a reaction to economic and political scandals in the 1970s in the form of business ethics (in CR in the 1990s) and corporate social responsibility[6]. The need to respect ethical aspects of economic activities was further accentuated by the processes of globalization (since the 1970s) (Sirůček & Džbánková, 2006).

Technology and its development go hand in hand with the economy. Close ties of interaction link both. On the one hand, there are threatened by a “technological totalitarianism” that excludes ethics from scientific research in general. On the other hand, the one-dimensional ethics of utilitarian economics dominate by the "tyranny of the power of money" (Laudato Si´, 2015). The development of science has brought much good to man, has contributed to the improvement of life, but at the same time, it is a source of great power.

[5] Ethics or moral philosophy is a branch of philosophy that studies in a systematic way, defends, and suggests concepts of right or wrong behaviour. Morality means principles concerning the distinction between right and wrong or good and bad behaviour; a particular system of values and principles of conduct. Morality and ethics are often used as synonyms.

[6] The requirement to take social considerations into account in corporate governance and social responsibility was defined by H.R. Bowen (1953). The modern concept of corporate social responsibility first appeared in the 1970s. The goal of CSR is to take responsibility for corporate activities and their positive impact on the environment, customers, employees, community and other stakeholders, including the public sector.

Moreover, it cannot be automatically assumed that an increase in power always means progress and good. Throughout our history, technical progress has always been made first by improving weapons. At the same time, of course, it brought many wonderful inventions and multiplied our human possibilities. The growing technological possibilities and the fear of mastering the power they raise a number of questions at the moral level (Mlčoch, 2017).

1.1 Hans Jonas' Ethics of Technology

One of the first to deal with the ethics of technology and to call for responsibility was the Jewish philosopher Hans Jonas (1903-1993). He questioned the so-called technical imperative: everything that is feasible with the help of technology is allowed to be done. He dealt with the risks that modern technology generates. Jonas's technology ethics is more than 30 years old, yet it offers a source of inspiration for contemporary ethical-technical discussion and ethical orientation. A person does not necessarily lose control of his technical power if he or she ethically reflects technical practice. Technical knowledge and practice should not resist critical self-reflection or reflection on other sciences, especially ethics. One should think more in-depth about the purpose and target of science. It does not always and necessarily only be a source of financial or material profit. He/she should moderately limit the escalation of technical power and respect the precautionary principle.

Jonas is not against technical progress because he really sees that we cannot do without it. But not approve a rule that we can undergo serious risk or cause severe damage and recklessly while relying on the fact that it will be resolved or removes by a technique that does not yet exist. The technique generates risks that cannot be predicted with absolute certainty. In the case of serious risks, it is necessary to establish a principle that responds to the uncertainties of the forecasts and at the same time provides ethically specific guidance on how to deal with them. Thanks to technology, a man crosses various types of borders, or it still pushes these boundaries, but at the same time, if it does so without self-reflection, it loses its ethical orientation - and sometimes partly internal freedom (Šimek, 2014).

1.2 Machine ethics

The first two decades of the 21st century have given us striking examples of what is commonly referred to as "autonomous technology" and "artificial" intelligence. There are autonomous cars and self-propelled drones, deep sea and outer robots, weapon systems,

software agents, etc. AI with the form of machine learning[7] and the growing availability of large datasets from different areas of life are the drivers of development. Connecting these technologies increases their speed and performance. They are used in the private and public sectors and can have both military and civilian uses. Increasingly frequent implementation of autonomous systems (AS) systems and artificial intelligence (AI) and their growing influence, however, raise the urgent need to deal with their consequences also in moral and legal terms (Acemoglu & Restrepo, 2018). (Shehadeh, Schroeder, Richert, et al. 2017)

Technologically, the autonomous system must fully replace and even surpass the human driver in terms of capacity. Sensors must recognize all objects. Current sensor data must be integrated and processed together with the accumulated experience that is part of the solution algorithm due to complex contextual relationships. The outcome of this process will be a statistical assessment of probabilities (risk and profit) for various possible reactions. Due to the complexity and variety of possible scenarios, the "right" response cannot be programmed in advance. It must be calculated based on a defined algorithm. From an ethical point of view, several fundamental questions need to be answered. Who should have the power to decide whether special rules and skills programmed into the system are acceptable? Who is responsible for the damage? How much differentiation in ethical programming should be allowed to different stakeholders (producers, users, societies)? At the same time, programming the risky behavior of the machine in critical situations defines the style of usual driving. How safe is it safe enough? How safe is it too safe? Empirical studies suggest that most people prefer a decision algorithm that minimizes overall damage. It seems that an acceptable level of risk can be calculated. Should the risk for all autonomous vehicles be the same? Legislators must lay down the general principles of the decision-making algorithm and assign the weights of different types of evil in a socially acceptable way (Birnbacher & Birnbacher, 2017). Scientists have been dealing with the issue of setting up the ethical rules of robots as well as the rules that should be followed by their creators and users for two decades[8]. European Group on Ethics in Science and New Technologies (EGE) of the European Commission defends the internationally recognized ethical and legal framework for the production, use and management of artificial intelligence is also advocated. The the EGE

[7] E.g. deep learning in medical diagnosis.

[8] Robotics and Automation Ethics is the branch of applied ethics which investigates the social and ethical issues of robotics and automation in the broader sense which includes all kinds of automated systems through the use of computer, information, communication, and control science and technology, and develops ethical methods for resolving them via the exploitation of traditional and novel ethical theories (such as deontological, utilitarianism, value-based theory, case-based theory, etc.) (Tzafestas, 2018).

proposes a set of basic principles and democratic prerequisites, based on the fundamental values laid down in the EU Treaties and in the EU Charter of Fundamental Rights (EC EU, 2018)[9].

2 Phishing for Phools

In the environment of the Fourth Industrial Revolution, personalized production will soon be envisaged, based on the ideas and wishes of each customer. There should be a direct and bilateral relationship of trust between the manufacturer and the consumer. But the reality is different. We are surrounded by omnipresent manipulation, deception and fraud. G. A. Akerlof a R. J. Shiller (2017) question that people always make the best decisions for themselves and emphasize the economic importance of psychological factors. They challenge the thesis of liberal economics that the invisible hand of the market always brings material welfare. Markets can also harm people because they are not immune to the use of fraud and psychological pressure. As part of our reflection on the ethical context of the functioning of modern economics and technology, we can be inspired by the study "Phishing for Phools"[10].It is the study on manipulation, cheating, the influence of money and politics, which also formulates general recommendations on how to prevent abusive practices. Everyone should count on being manipulated. More information, more profound knowledge, adequate reforms and regulations can be defended. Phishing for Phools is really natural and rational in the privately capitalist cushions (Akerlof & Shiller, 2017). However, it is ethically acceptable?

2.1 Planned obsolescence

One of the ethically controversial practices in the capitalist economy is the planned obsolescence or deliberate shortening of product life. Repair is either not possible or is overpriced. It is the production of goods with an uneconomically short lifetime, in an effort to ensure the sales of industrial production to consumers. Planned obsolescence as a production policy emerged already in the late 19th century. One of the first representatives of a more sophisticated concept of planned obsolescence was, for example, Thorstein Veblen. The views and concepts of planned obsolescence have gradually evolved and changed. The planned obsolescence combined with advertising fully complies with the principles of

[9] Suggested Ethical principles and democratic prerequisites: human dignity; autonomy; responsibility; justice, equity, and solidarity; democracy; rule of law and accountability; data protection and privacy; sustainability.
[10] The text presents a number of examples from American everyday life (advertising and marketing, real estate, car and credit card sales, lobbying and politics, food and pharmaceuticals, innovation and economic growth, alcohol and tobacco), but also from the financial markets.

consumer society. Improving product durability and serviceability may save natural resources and money, but may not always be in the best interest of all manufacturers.

To support competitiveness, sustainable development and jobs, the European Union (EU) adopting the transition to a circular economy in December 2015[11] It, therefore, renews interest in policies to promote durability and address planned obsolescence. Various legislative approaches are currently being used to stimulate the design of durability and repairability at EU and Member State level. The EU has begun to regulate durability through the Ecodesign Directive. Member States have used other legal approaches such as more extended consumer guarantees, criminalization of planned obsolescence and measures to promote the availability of spare parts, etc. (Maitre-Ekern & Dalhammar, 2016).

Conclusion

New technologies, headed by AI, are meant to absolutely reduce the need to work in all spheres and create a large amount of free time. Let us not forget, however, that the 4.0 processes take place in capitalist, private ownership and market boundaries. Lack of work means a lack of resources for life. And we have to ask ourselves a question. Will the new production processes not ultimately be confined to a group of companies from the developed world? Moreover, benefits are expected primarily for advanced countries (growth of competitiveness, new production capacities, demise, but also job creation, etc.) and severe threats to other countries, which are to be more beneficiaries of risks, costs and perils. Smart factories will certainly not be for everyone, and it will be a strategic advantage and a weapon. The development of science has brought much good to man, has contributed to the improvement of life, but at the same time, it is a source of high power. But the modern man is not trained to use this power properly. The huge boom in technology was not accompanied by adequate human development in terms of responsibility, values and conscience. Therefore, the only real revolution must take place in our hearts and minds. It is a paradigm shift, both technical and economic. *"Even the most extraordinary scientific advances, astonishing technical achievements, marvellous economic growth, if they are not bound to authentic social and moral progress, ultimately turn against man"* (Laudato Si', 2015).

Acknowledgment

[11] The Circular Economy is the fulfilment of the definition of "sustainable development". It is a gentle and permanently cyclical (infinitely repeated) form of natural resource use. This extends the product life cycle and minimizes waste.

This article is provided as one of the outputs of the research project of the Faculty of Business Administration IP 300040 „Competitiveness“.

References

1. Acemoglu, D. & Restrepo, P. (2018 JUN). The Race between Man and Machine: Implications of Technology for Growth, Factor Shares, and Employment. *American Economic Review*, 108(6), pp. 1488-1542.
2. Akerlof, G. A. & Shiller, R. J. (2017). Jak se loví hlupáci. Ekonomie manipulace a klamu: Nenechme sebou manipulovat. Praha, Česká republika: Management Press
3. Birnbacher, D.; Birnbacher, W. (2017 SEP-OCT). Fully Autonomous Driving: Where Technology and Ethics Meet. *IEEE Intelligent Systems*, 32(5), pp. 3-4.
4. Brynjolfsson, E. & McAfee, A. (2015). *Druhý věk strojů: Práce, pokrok a prosperita v éře špičkových technologií.* Brno, Česká republika: Jan Melvil.
5. European Commission (2018 MAR). *Artificial Intelligence, Robotics and 'Autonomous' Systems.* [vid 2019-03-10]. Dostupné na: http://ec.europa.eu/research/ege/pdf/ege_ai_statement_2018.pdf
6. Laudato si' (2015). [online]. Řím: *Vatikánský rozhlas*, 2015-06-18 [cit. 2019-01-22]. Dostupné na http://www.farnostsusice.cz/doc/encyklika-laudato-si.pdf?1442638547358.
7. Maitre-Ekern, E., Dalhammar, C. (2016 NOV). Regulating Planned Obsolescence: A Review of Legal Approaches to Increase Product Durability and Reparability in Europe. *Review of European Comparative & International Environmental Law*, 25(3), pp. 378-394. Dostupné na: https://doi-org.zdroje.vse.cz/10.1111/reel.12182.
8. Mlčoch, L. (2017). *Etika techniky a ekonomie*. SO ČBK. [vid 2019-02-10]. Dostupné na: https://www.socialninauka.cz/archiv/clanky-rok-2017/etika-techniky-a-ekonomie-lubomir-mlcoch.html
9. PwC (2018). *Will robots really steal our jobs?* Report [vid 2019-03-17]. Dostupné na: //www.pwc.co.uk/economic-services/assets/international-impact-of-automation-feb-2018.pdf.
10. Shehadeh, M. A.; Schroeder, S; Richert, A; et al. (2017, OCT 05-08). Hybrid Teams of Industry 4.0 A Work Place considering Robots as Key Players. In. *IEEE International Conference on Systems Man and Cybernetics Conference Proceedings*, pp. 1208-1213.
11. Sirůček, P. & Džbánková, Z. (2006): Racionalita a etická dimenze v ekonomických teoriích (vybrané problémy). *Ekonomie a Management*, 9(3), pp. 19-34.
12. Sirůček, P & Džbánková, Z. (2017). Revolution 4.0 a New Economy? In: Löster, T. & Pavelka, T. (ed) 11th International Days of Statistics and Economics Conference

Proceedings [online]. Praha, Prague, 14.09.2017 –16.09.2017. Slaný: Melandrium. pp. 1440-1449. Dostupné z: https://msed.vse.cz/msed_2017/sbornik/toc.html

13. Sirůček, P. (2017): Bublifuk 4.0? *Marathon* [online]. 145, roč. 21, zvláštní číslo, pp 3-34, pp. 56-64. Dostupné na: http://valencik.cz/marathon/doc/Mar17z.pdf.
14. Šimek, V. (2014). Etika techniky podle Hanse Jonase. *Filosofie dnes*, 6(1). [vid 2019-02-10]. Dostupné na: https://filosofiednes.ff.uhk.cz/index.php/hen/article/view/153.
15. Tzafestas, S.G. (2018). Ethics in robotics and automation: a general view. *International Robotics & Automation Journal*, 4(3), pp. 229-234. DOI: 10.15406/iratj.2018.04.00127.

Contact

Zuzana Džbánková
University of Economics, Prague, Faculty of Business Administration, Department of Managerial Economics
Sq. W. Churchill 1938/4, 130 67 Prague 3, Czech Republic
dzbank@vse.cz

Pavel Sirůček
University of Economics, Prague, Faculty of Business Administration, Department of Managerial Economics
Sq. W. Churchill 1938/4, 130 67 Prague 3, Czech Republic
sirucek@vse.cz