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PROBLEMS OF POLICY REGULATION ON ROBOTICS

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The article discusses the main problems in the field of legal regulation of the functioning of the robots, definition of “robot”, as well as the understanding, interpretation, and evaluation of the civil liability for the robot’s actions are viewed in the paper. The article analyses the possibility of endowing robots with legal personality, as well as various approaches to liability for damage caused by a robot to property or to a person. The question is raised about bringing the robot to criminal and civil liability. The question is raised about the regulation of intellectual property rights to an object created by a robot. If a robot creates music, a picture or text, who owns the rights to them: the robot developer or the head of the creative process, whether the robot itself. The article analyses a feature that is very important for the legal perspective of the problem – it is a turn from understanding a robot as an entertainment product to the direction of development and research of social interaction between a robot and a human. The question is raised about the need to adopt new legal norms aimed at regulating the legal status of a robot, liability for damage caused by it, as well as legal problems of intellectual property associated with the functioning of robots. The analysis of the legal frameworks regarding robots in different countries of the world is performed. The article introduces the need to develop appropriate legislative support in the field of robotics: interpreting the term “robot”, determining the legal regime of its functioning, developing a unified approach to liability for harm caused by a robot and developing uniform rules for protecting intellectual property rights when using a robot. Legal regulation is necessary not only at the national level, but also globally.

Keywords: robot, law rules on robotics, civil liability of a robot, intellectual property.

Introduction. The rapid development of technology has transferred the issue of artificial intelligence from a fantastic plane to everyday life. A very large number of not only purely technical but also social problems arise, which can be designated by the concept of “socialization of artificial intelligence”. Judging by the rapid development of artificial intelligence, more and more assumptions arise that robots eventually will become more involved in the everyday life of a human being. This assumption caused a large number of discussions of ethical and legal matters: Can robots be granted rights and bear responsibility? What kind of offences and penalties will be applied to them? How will the labour market change? What type of activities can be trusted to robots and which of jobs (if any) will remain human only? What actions should be taken regarding employment in the face of population growth and the projected shrinking of the human labour market? What will be the education of the robots? Finally, the main question is How to secure humanity? Most experts agree that these issues will worsen eventually. Nowadays, robots occupy an important place in various spheres of our lives, and furthermore, some of those spheres, such as industry, space, and medicine, can no longer be imagined without their utilization. Currently, approximately 1.7 million robots exist in the world (androids, bots, etc.), but their use is not properly regulated. The complexity of the situation is that technological trends require a deliberate process and a comprehensive, interdisciplinary discussion

of these issues. Given the changes that smart machines can bring into our lives, we need to create effective rules for interaction between humans and robots. Therefore, it is necessary to identify the main problems, which can arise in society and legal systems due to the rapid development of technologies, to define the possible solutions to existing or anticipated problems, to develop approaches to regularization of these technologies.

The purpose of the article is to present the current state of law rules and to analyse the various approaches to the definition of the robot, to present the modern understanding of the theoretical and practical problems that emerge in society with the advent of new technologies.

Discussions. The emergence of robots in human life provides for the solution to a number of emerging problems. These are issues of legal terminology, and a program for professional retraining and psychological adaptation of personnel, whose jobs can be fully automated, as well as changes in the education system and the modernization of many related areas and areas in connection with the introduction of machines and artificial intelligence into the country's economy. Let's dwell on some of them.

Problem of definition. The first problem that needs to be resolved is the legal definition, that is, the formulation of the concept of "robot" at the legislative level. But before doing this, we need a clear idea of what we mean by the word "robot". There are dozens of interpretations and definitions of the concept of "robot" in the world. The word "robot" came into use after Karl Czapek's science fiction play about artificial people was released in 1920. In the play "R.U.R." the term meant intelligent machines that help a human to perform hard, impossible tasks. The Robot is derived from the Czech word "*robota*" – "forced labour", and "rob" – "slave".

With the help of the robot, on the one hand, a human wanted to escape the hardest and the most exhausting activities that required extensive resources, while on the other hand, he wanted to multiply his abilities without any changes in human nature. Such functional view of robots can be also traced in books on specialized subjects where robotics is referred to as a science «about technical devices capable to replace a person in the performance of complex, monotonous, tedious, unsafe work» [1], developed in the 60s of the 20th century.

Horst Eidenmueller, considering the robot as an embodied AI, emphasizes that the smart robots with the ability of machine learning not only use the huge volume of existing data but also gather it from its own experience and incoming data, adjusting the behavior and improving its skills during the environment-robot interaction [2]. Neil M. Richards and William D. Smart define that a robot is a constructed system that displays both physical and mental agency, but is not alive in the biological sense [3]. Ryan Calo suggests defining robots as the mechanical objects that take the world in, process what they sense, and in turn act upon the world [4]. He takes as a principle the so-called «sense-think-act» paradigm, which can be used to distinguish robots from other technologies. He suggests defining robots as a set of characteristics: perception of the world, processing of the incoming data, and influence on the environment.

In 2012, the International Organization for Standardization (ISO) adopted the international standard ISO 8373:2012 «Robots and robotic devices. Vocabulary». This International Standard specifies vocabulary used concerning robots and robotic devices operating in both industrial and non-industrial environments. It provides definitions and explanations of the most commonly used terms, which are grouped into clauses by main topics of robotics [5]. The document provides different categories of robots. Even qualified robotics engineers do not have a unified precise definition. Thus, the Report of COMEST on robotics ethics 2017 emphasizes that defining a «robot» is a complex and possibly open-ended task due to the rapid developments in robotics. Focusing on the etymology of the word «robot» is of little help when it comes to defining what a robot is. To say that a «robot» is something created to do certain work is relatively uninformative because there are many things that fit this description but which do not count as robots (e.g. personal computers or cars). The report provides the example regarding the modifications of different robot generations as well as the number of definitions. Consequently, the Report offers that contemporary robots can be characterized by four central features:

- mobility, which is important to function in human environments like hospitals and offices;
- interactivity, made possible by sensors and actuators, which gather relevant information from the environment and enable a robot to act upon this environment;
- communication, made possible by computer interfaces or voice recognition and speech synthesis systems;
- autonomy, in the sense of an ability to «think» for themselves and make their own decisions to act upon the environment, without direct external control [6].

Furthermore, in February of 2017, the European Parliament adopted the resolution with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)), in which it has been stated that there is a need to create a generally accepted definition of robot and AI that is flexible and is not hindering innovation [7]. Hence, it calls on the Commission to propose common Union definitions of cyber-physical systems, autonomous systems, smart autonomous robots, and their subcategories by taking into consideration the following characteristics of a smart robot:

- the acquisition of autonomy through sensors and/or by exchanging data with its environment (inter-connectivity) and the trading and analyzing of those data;
- self-learning from experience and by interaction (optional criterion);
- at least a minor physical support;
- the adaptation of its behavior and actions to the environment;
- absence of life in the biological sense.

In addition, for the purposes of traceability and to facilitate the implementation of further recommendations, a system of registration of advanced robots should be introduced, based on the criteria established for the classification of robots. The system of registration and the register should be Union-wide, covering the internal market, and could be managed by a designated EU Agency for Robotics and Artificial Intelligence in case such an Agency is created [7].

Civil Law Rules on Robotics and civil liability. The second question that requires a solution based on the functioning of robots is the question of civil liability for damage, caused by them. The European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)) points out that because of the stage reached in the development of robotics and AI, to start with civil liability issues. Considers that the civil liability for damage caused by robots is a crucial issue which also needs to be analysed and addressed at the Union level to ensure the same degree of efficiency, transparency, and consistency in the implementation of legal certainty throughout the European Union for the benefit of citizens, consumers and businesses alike [7].

There are already quite a few real and potential situations dangerous to humans involving robots, where specific culprits must be identified. For example, if a drone drops its cargo, which will harm a person or his property, then who will be to blame? Even more, such situations are predicted in connection with the appearance of unmanned vehicles on the roads. Who should be found guilty of an accident on the road, and how should a robot act in such a situation, what moral and legal norms should be the basis for its decisions? After all, a robot is not a person who can make decisions on the road spontaneously. He can only act as it is in the program. Those. ethical and legal norms, according to which it will act in a critical situation, must be laid down in it by its creators. Thus, manufacturers, car owners, technology developers, suppliers, insurance companies can be identified as potential culprits. This is one of the most complex and confusing legal problems of robotics, which allows for different solutions based on the situation. There are several points of view regarding liability for damage caused by a robot:

- total exclusion of liability for each party of an accident. Therefore, the actions of autonomous vehicles should be classified as force majeure;
- partial exoneration from liability. This approach is different only in terms of compensation, awarded to the affected party. The question, in this case, is only to define the Indemnitor: should it be the insurance fund or the robot's owner;
- the liability depending on the guilt, i.e. depending on who had caused the damage by the robot. For example, if the situation is caused by the defects in construction, the creator is held guilty; if it was caused by the computer incident – the developer. If the robot has the ability of machine learning – a party, who contributed most to its training. If the robot is performing the specific commands – the operator of the machine, etc.;
- full liability of the particular party. A certain party (depending on confirming the civil liability by law) is held responsible for all the actions of the robot by default (depending on the civil liability rules, it can be the developer or the owner);
- personal liability of a robot, which implies the acquisition of legal personality by the robot. However, the opinions of the legal experts differ on various key points. First, the expert inquires if the classic Roman Civil law with the concept of legal personality can be applied in this case. Can a robot be considered a legal subject (although it is already considered the subject of social relations)? Similar disputes were held in Ancient Rome whether a slave can be considered an animate object or just a property. The important and the most complicated set of questions, which has been discussed in the context of the development of intelligent robots, is the problem of definition of its legal status as a subject or as an object. Originally, the robot has been considered purely as an object that could be appropriated (created, destroyed, handed by the deal, etc.). Such an approach is applicable nowadays: legally the robot is a property, not a “persona”; it is an object, not a subject of legal relationship. However, in recent years, the debate regarding the possible legal personality of the robot has been growing.

John Buyers notes that until relatively recently, the question of whether or not a machine should be accountable (and hence liable) for its actions was a relatively trite one – a machine was merely a tool of the person using or operating it. There was absolutely no question of a machine assuming a level of personal accountability or even

“personhood” as they were incapable of autonomous or semiautonomous action [8]. If it is presumed that the robot cannot be directly responsible for its own actions, that it cannot have a legal personality, a different problem arises in determining the appropriate liable party, since the scope of persons involved in the regulation and administration of robotic behavior is too wide, where owners, operators, planners can be included. Assuming that the liability can be divided between the above-mentioned parties, the problem arises of determining and apportioning the guilt of such parties, especially if not taking into consideration the situations when the robot is deliberately programmed by a particular party to cause lethal injury to a human, but rather the situations when it is difficult to prove the intentions of the particular party to cause harm, to prove that the party was aware of the possible damage that could be inflicted.

However, nowadays the following major characteristics of modern robots actualize the problem of the definition of their legal personality and their civil liability: autonomy and self-management, self-learning from experience and by interaction, ability to think and act rationally. The combinations of those characteristics lead to a probability of action, which were not foreseen by the creator or developer. Peter M. Asaro mentions that some aspects of the legal personality can still be applied to subjects that do not fully correspond to the notion of a personal. In this point of view, the robots can be considered as agents with quasi-legal personalities [9]. According to some of the authors, the granting of certain quasi-rights to the robot is not about granting them real rights, but rather a legal fiction aimed at simplifying the application of existing laws.

In some areas in relation to its functioning, a robot can be endowed with some rights and a certain quasi-legal personality. However, in the area of criminal liability, it's impossible because the robot doesn't have self-awareness therefore the men's area (guilty mind) of the robot is completely absent. Gabriel Hallevy notes that the key element of the possibility of criminal prosecution of robots must be the existence of the men's area (guilty mind) [10].

Even a robot prosecution will not achieve the goals of criminal punishment, since the robot cannot (fundamentally) correct itself by the fact of prosecution. The severity of the potential punishment will not prevent his actions, because they are indifferent to the robot. «Reeducation» of the robot can be achieved only through complete reprogramming or recycling of it. Karel Čapek was the first to come up with the term «robot» and was discussing the question of if the «intelligent» machine had personal characteristics. For 100 years, there is no clear answer. Nowadays, there are several conflicting suggestions: some experts hold to the view that a robot cannot be recognized as a legal personality. In such a case, to simplify the solution of the question of the robot's liability it is possible to define it as an «object, a source of increased danger with a certain built-in autonomy». Other experts declare in favour of giving the robot a limited legal personality that could be applied to robots yet today. This limited legal personality is expected to expand as robotics evolve. Some experts propose to equate a robot with a human. The robot will be endowed with a full legal personality hence a full range of rights and duties. A precedent in international legal practice occurred in 2017 when the humanoid robot Sophia first received official citizenship. Now Saudi Arabia has its own world's only robot-citizen. However, the specialists met with a mixed reception the thesis of granting robots a legal status, especially the actual granting of «human rights». Although the first robot has already appeared in the world with a specific status of a citizen, and the increasing number of questions in the scientific literature regarding the legal personality of the robot, most experts believe that currently the negative consequences of using robots must be held by the creator, the owner or the operator. The Recommendation № 2102 (2017) of Parliamentary Assembly of the Council of Europe «Technological convergence, artificial intelligence and human rights» notes the fact that responsibility and accountability of an act lie with the human being, no matter what the circumstances may be. References to independent decision-making by artificial intelligence systems cannot exempt the creators, owners, and managers of these systems from accountability for human rights violations committed with the use of these systems, even in cases where an act causing damage was not directly ordered by a responsible human commander or operator [11]. The position of the European Parliament in this regard is of considerable interest. The Commission on Civil Law Rules on Robotics considers that, whatever legal solution it applies to the civil liability for damage caused by robots in cases other than those of damage to property, the future legislative instrument should in no way restrict the type or the extent of the damages which may be recovered, nor should it limit the forms of compensation which may be offered to the aggrieved party, on the sole grounds that damage is caused by a non-human agent; Considers that, in principle, once the parties bearing the ultimate responsibility have been identified, their liability should be proportional to the actual level of instructions given to the robot and of its degree of autonomy, so that the greater a robot's learning capability or autonomy, and the longer a robot's training, the greater the responsibility of its trainer should be; notes, in particular, that skills resulting from “training” given to a robot should be not confused with skills depending strictly on its self-learning abilities when seeking to identify the person to whom the robot's harmful behaviour is actually attributable; notes that at least at the present stage the responsibility must lie with a human and not a robot [7]. Thus, according to the lawyers themselves, their task is not to find substantive answers, but to propose optimal, consistent rules of conduct, legal

constructions for the status quo. At this stage, it is of high importance to find some reasonable balance between the new technologies and the old constructions of traditional law.

Intellectual property. The next reasonable legal problem for robots' operation is the regulation of intellectual property. Modern robots are capable of creating original texts, images. Thus, if a robot creates music, a painting, or a text. Who owns the rights to? Is it the creator of the robot or the operator of the process of creation of the original object? Is it the robot itself? Alternatively, perhaps such rights shouldn't belong to anyone and be automatically considered the public domain? The choice of a particular solution remains open.

Concerning the functioning of robots in the context of intellectual property law European Parliament Resolution of 16 February, 2017 with recommendations to the Commission on Civil Law Rules on Robotics notes that there are no legal provisions that specifically apply to robotics, but that existing legal regimes and doctrines can be readily applied to robotics, although some aspects appear to call for specific consideration; calls on the Commission to support a horizontal and technologically neutral approach to intellectual property applicable to the various sectors in which robotics could be employed [7].

Nowadays a certain tendency appeared to use robots not only as tools for the creation of products and inventions but also as almost full-fledged authors, with less and less human involvement in the creation of inventions and products, wherein the contribution of a human to the direct creation of an object is minimal or non-existent. The above-mentioned situation raises the issue of whether the robot can act directly as an author under intellectual property law, with all the legal consequences that this entails. The question of whether the individual rights of robots over the results of their intellectual activity can be recognized is inseparable from the question of the legal personality of robots in general. Currently, the idea of possibility and advisability of changes in intellectual property law is increasingly brought out at the level of individual private research in technology and robotics as well as at the level of public authorities in several countries in order to recognize the robot's rights to created products and inventions. For example, the experience of Japan is of particular interest. In 2016 in Japan the «Intellectual Property Strategic Program 2016» has been signed. It is based on four concepts, the first of which is called «Promotion of Intellectual Property Innovation for the 4th Industrial Revolution» and contains the construction of Next Generation Intellectual Property System Adapted to Digitization and Networking, it presumes the construction of a new copyright system. Intellectual Property Strategic Program 2016 contemplates to construct a new copyright system enabling smoother utilization of the ever-increasing volume and variety of copyrightable data resulting from the proliferation of digital networks; examine the nature of IP protection for new information goods, such as works created autonomously by artificial intelligence [12].

According to Ryan Abbot, the computer's owner should be the default assignee of any invention because this is most consistent with the rules governing ownership of property and it would most incentivize innovation [13]. According to Sinelnikova V.N. and Revinsky O.V., computer programs or other innovative technologies are only a means of generating new results, to which the software developers and (or) the creators of the relevant equipment should have rights [14].

One of the objectives of intellectual property rights mechanisms is to ensure that the creator of the product or invention receives the economic benefits of its use by others. The robot does not and cannot have such a need as such. According to Andrea Moriggi, granting intellectual rights to the products created by robots to the robots themselves leads to a challenge to the foundations of intellectual property law [15].

The alternatives to giving robots rights to the results of their intellectual activity are, first, the transfer of all rights to a human subject that has participated in these activities of artificial intelligence in any way, or immediately converting such products and inventions into the public domain.

Ralph D. Clifford notes that the development of stand-alone creative computer programs poses a challenge to existing intellectual property rights concepts [16]. In any case, the patent system must recognize the implications of and be prepared to respond to a technological reality where leaps of human ingenuity are supplanted by AI, and the ratio of human-to-machine contribution to inventive processes progressively shifts in favour of the machine. Given the great potential societal benefits of accelerating the pace of innovation, the system must adjust to ensure it continues to appropriately protect intellectual investment and incentivize the development of computer-generated inventing systems; however, this must be balanced against the risk that the quantity and nature of computer-generated inventions will stretch the patent system to its breaking points, both conceptually and practically. The balance will be increasingly challenging if, as some people believe, technology will advance such that computers and AI will displace humans from the inventive process altogether, even if not in the immediate future [17].

Conclusion. In the face of full-scale automation, the developed countries of the world and the European Area faced the probable necessity to introduce the law rules on public relations arising with the participation of «intelligent» devices capable of performing complex operations and solving intelligent tasks. The intensive development

of technologies requires the evolution of law in this field. However, it's difficult to perform without an adequate understanding and interpretation of the term «robot», a definition of the legal regime for its operation, developing a consistent approach to liability for injuries caused by robots, and developing unified rules for the protection of intellectual property rights when using robots. The Parliamentary Assembly of the Council of Europe in Recommendation 2102 (2017) «Technological convergence, artificial intelligence, and human rights» notes with concern that it is increasingly difficult for lawmakers to adapt to the speed at which science and technologies evolve and to draw up the required regulations and standards; it strongly believes that safeguarding human dignity in the 21st century implies developing new forms of governance, new forms of open, informed and adversarial public debate, new legislative mechanisms and above all the establishment of international cooperation making it possible to address these new challenges most effectively [11].

Thus, the introduction of robots raises new challenges that currently do not have clear answers in modern law and practice.

References:

1. Tsvirkun, L.I., & Gruler, G. Robotics and mechatronics: navch.posib. National Mining University, 216p.L. I. Cricket and G. Gruler, Robotics and mechatronics: a textbook, 3rd ed. Ministry of Education and Science of Ukraine, National Mining University, 2017. 224 p.
2. Eidenmueller H. The Rise of Robots and the Law of Humans. Oxford Legal Studies Research Paper. 2017. № 27. Available at SSRN. URL: <https://ssrn.com/abstract=2941001> or <http://dx.doi.org/10.2139/ssrn.2941001>.
3. Richards N.M., Smart W.D. How should the Law Think about Robots? Robot Law. vol. Chapter 1, Cheltenham, UK: Edward Elgar Publishing, 2016. – 402 p.
4. R. Calo, Robotics and the New Cyberlaw SSRN Journal, 2014, doi: 10.2139/ssrn.2402972.
5. ISO 8373:2012 «Robots and robotic devices. Vocabulary», available at <https://www.iso.org/obp/ui/#iso:std:iso:8373:ed-2:v1:en>
5. COMEST (2017). Report of COMEST on Robotics Ethics. UNESCO, available at <https://unesdoc.unesco.org/ark:/48223/pf0000253952>.
6. European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)) https://www.europarl.europa.eu/doceo/document/TA-8-2017-0051_EN.html
7. Buyers J. Liability Issues in Autonomous and Semi-Autonomous systems. Osborne Clarke LLP January 2015, available at https://www.osborneclarke.com/media/filer_public/c9/73/c973bc5c-cef0-4e45-8554-f6f90f396256/itech_law.pdf.
8. P. Asaro. Robots and Responsibility from a Legal Perspective. 2007.
9. Hallevy G. The criminal liability of artificial intelligence entities – from science fiction to legal social control. Akron Intellectual Property Journal. 2010. Vol. 4. P. 171–201.
10. Recommendation № 2102 of Parliamentary Assembly of the Council of Europe «Technological convergence, artificial intelligence and human rights», 28 April. 2017. URL: <https://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=23726&lang=en>.
11. Intellectual Property Strategic Program (2016), available at https://www.kantei.go.jp/jp/singi/titeki2/kettei/chizaikeikaku20160509_e.pdf.
12. Ryan Abbott, I Think, Therefore I Invent: Creative Computers and the Future of Patent Law, 57B.C.L. Rev.1079. 2016, available at <http://lawdigitalcommons.bc.edu/bclr/vol57/iss4/2>.
13. Sinelnikova V.N., Revinsky O.V. Rights to the results of artificial intelligence. Copyright № 4. P. 17–27. P. 26.
14. Moriggi A. The role of intellectual property in the intelligence explosion. 4iP Council Research Award Winner 2017 (Second Place), available at http://www.4ipcouncil.com/application/files/9615/1638/1031/The_Role_of_Intellectual_Property_in_the_Intelligence_Explosion.pdf.
15. Ralph D. Clifford. Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up? Tulane Law Review. 1997. Vol. 71. P. 1675–1703. P. 1702.
16. Erica Fraser. Computers as Inventors – Legal and Policy Implications of Artificial Intelligence on Patent Law. SCRIPTed. 2016. Vol. 13. № 3. P. 305–333. P. 323.