

ARTIFICIAL INTELLIGENCE AND THE PROBLEMS OF CIVIL LIABILITY

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Abstract.

The article focuses on the problems of determining the civil liability of artificial intelligence with due regard to the real risks which humanity faces in everyday life due to the widespread use of artificial intelligence systems: damage caused by autonomous vehicles, medical or household artificial intelligence systems, etc. The need to study the issues of civil liability of artificial intelligence is due to the following questions that need to be answered: do the current regimes of civil liability provide a reliable basis for addressing the problems associated with harm caused by artificial intelligence systems, especially those based on machine learning; what are artificial intelligence systems from the point of view of law; is liability possible when it is impossible to establish whose actions caused the harm? The author analyses the concepts of legal scholars on legal personality and civil liability of artificial intelligence, as well as the provisions of the documents regulating the relevant relations (Resolution on the civil law regulation of robotics with recommendations for the European Commission of 16 February 2017, Ethics guidelines for trustworthy AI, White Paper on Artificial Intelligence: A European approach to excellence and trust, published on 19 February 2020 (White Paper On Artificial Intelligence - A European approach to excellence and trust, Artificial Intelligence Liability Directive, EU Product Liability Directive (PLD), EU Artificial Intelligence Act (AI Act)). The author concludes that it is necessary to establish no-fault liability for AI systems with a high risk of liability. The author proves that the rules on liability for the quality of products and services should be applied to other cases of damage. The author also proves, both at the doctrinal and legislative levels, the need to determine the legal status of such an entity as an "electronic person" with recognition of it as a quasi-legal entity and granting it with the appropriate scope of tort capacity.

Keywords: legal liability, civil liability, artificial intelligence, virtual reality, product quality, fault, causal effect, no-fault liability, risk.

Research methods.

In the process of analysing the issues covered by this research, the author used the relevant general scientific and special methods of scientific knowledge. Among the most important of them is the dialectical method, with the help of which legal liability was studied as a type of social responsibility, and the peculiarities of legal liability in the digital era were determined. The application of this method also made it possible to determine the specifics of legal liability in relation to artificial intelligence systems, considering it in the context of the general theoretical concept of legal liability, as well as at the level of civil law theory. The functional method made it possible to clarify the features and functional purpose of legal liability in the digital age. The comparative legal method was used to analyse a number of aspects of the issue that is the subject of this study, and in particular, it was used to compare different approaches to the definition and characterisation of legal liability, as well as to analyse the approaches used in the study of legal liability of artificial intelligence. In addition, the method of logical analysis was also used in formulating conclusions and proposals based on the results of this study, taking into account the requirements for certainty, consistency, consistency and validity of judgments and implementation within the framework of general theoretical and sectoral constructions using the conceptual apparatus of the relevant branches of science.

At the same time, against the background of Ukraine's increasingly consistent orientation towards European values, the values of an open society have also led to an increase in the importance of the anthropological (human-centred) method in civil law research, the task of which is increasingly to study the relationship between individual rights and human rights. A special place among the problems of choosing a methodology for civil law research on the issues of civil liability is occupied by the issue of determining the essence and significance of artificial intelligence: both as an object of civil law research and as a participant thereof (either as a quasi-researcher or, possibly, as an equal participant in scientific research). The horizons that are opening up here are currently impossible to discern, but it is fairly safe to assume that a significant amount of research in the field of jurisprudence is already being carried out with some degree of adjustment by generative artificial intelligence.

The syncretic method of research was also used, since the terms «artificial intelligence», «generative artificial intelligence», etc. are inherently a combination/merger, a complex manifestation of self-sufficient or even incompatible and incomparable phenomena and ways of thinking.

1. Legal liability: concept and essence

One of the legal categories that has been in the focus of attention of legal scholars for almost the entire period of existence of law as a social phenomenon is «legal liability». This concept (the use of the term «concept» here seems to us to be more accurate, since the characterisation of any legal liability necessarily implies an emotional component, which is largely due to the distinction of «positive/prospective liability») has been considered and studied from different angles [1], but active discussions are ongoing [2].

The need to study and comprehensively analyse the essence of legal liability in the digital age is also due to the fact that the insufficient development of methodological issues of artificial intelligence liability leads to deficiencies in the regulation of the relevant relations. There is clearly an urgent need to modernise the understanding of liability, to define its peculiarities in a world that

is no longer homogeneous, where a virtual, digital space is emerging in which there are actors whose legal status should be determined [3, pp. 325-328].

The study of legal liability as one of the fundamental categories of jurisprudence currently follows several main directions. Analysing them, it can be concluded that in philosophy, sociology and ethics, the basic concept is social responsibility, which is usually considered as a combination of internal factors of personal behaviour with a sense of duty, forms of internal and external control or the ratio of a person's ability and capacity to predict the results of his or her actions. At the same time, the conscious, voluntary and free compliance with legal requirements by an increasing number of citizens is accompanied by a narrowing of the scope of state coercion [4, p. 101].

The existence of social responsibility is determined by a number of subjective and objective factors. The objective factors include the social nature of man and the regulation of social relations by social norms. The subjective factor is human free will. Currently, scholars are unanimous that legal liability is a type of social responsibility [5]. (I. Kanzafarova believes that this remark applies only to «civil scientists» [6, p. 78]). Responsibility as a social category reflects the two-way relationship between a person and a particular social group of which he or she is a member, with regard to the established norms of behaviour. On the one hand, this connection, directed from society to the individual, embodies the requirements that it puts forward to its members, to their socially significant behaviour. On the other hand, it is the attitude of a person to these requirements. Responsibility, therefore, is an individual's understanding of the consequences of his or her actions, management of behaviour in accordance with what is right, and, consequently, the transformation of what is right into an internal motivation.

Therefore, in our opinion, it is reasonable to assess legal responsibility as negative, which exists alongside positive responsibility, which is a moral phenomenon. It should be noted that a broad interpretation of the concept of legal liability, in which legal liability is identified with social liability, including both negative and positive liability, may lead to an incorrect characterisation of this phenomenon.

Therefore, we agree with the statement that legal liability is a negative impact on the offender by specific state authorities, which are obliged to apply state coercion, as provided for by law [7, p. 35].

In our study, we are further guided by the understanding of liability as retrospective liability, the defining features of which are that it: 1) is external to the original relationship; 2) is applied only for the commission of an offence; 3) is associated with state coercion in the form of punitive and remedial measures; 4) is defined in the rules of law [8, p. 23].

The above signs of legal liability are not exhaustive, but give an idea of its nature and features.

2. Specifics of civil liability and challenges of the digital world

In turn, from the point of view of its practical significance, civil liability is the most important for ensuring everyday human life (civil circulation).

Without dwelling here on the peculiarities of characterisation of civil liability by the proponents of different accents of its vision, which have recently been the subject of a special study [9, p. 104], It should be noted that all national concepts of legal liability can be divided into two groups: 1) those which consider legal liability in the context of the theory of state (public law) coercion, and 2) those which consider legal liability in the context of the theory of legal relations.

In our opinion, these concepts of legal liability do not exclude each other, but reflect different methodological approaches to the definition of a complex legal phenomenon taken in its essential manifestations.

However, in order to make the use of these approaches as effective as possible, when referring to the category of legal liability, it is necessary to proceed from the aspect of legal liability which interests us in this case. If the subject matter of the study is the principles or functions of legal liability, the starting point should be the characterisation of the latter as a means of state legal coercion. If we analyse the subjects of legal liability, their rights and obligations, etc., the methodological basis of the study should be the provisions of the theory of legal relations, on the basis of which the relevant aspects of legal liability as a type of security legal relations are considered [8, p. 29].

In view of the above, we should also take into account that civil liability has certain peculiarities due to the fact that it is not aimed at punishing the offender, but at restoring the subjective civil right of the injured person or compensating him/her.

The defining features of civil liability include: 1) property nature; 2) liability of one party to civil law relations to others (victims); 3) possibility of exceeding the amount of liability compared to the amount of damage caused (for example, application of a penalty, deposit); 4) application of equal measures of liability for similar offences, which ensures consistent implementation of the principle of equality of participants in civil law relations [10, p. 104].

It should be noted that the concept of liability in civil law differs from the general theoretical concept and from sectoral concepts based on the concept of *corpus delicti*. Civil liability arises on the following grounds: unlawfulness, negative consequences, fault [11]. Regarding the latter, it should be recalled that the psychological concept of guilt, if applicable, can only be applied to the actions of individuals who have a psyche, and hence the possibility of a mental attitude to their own actions. Artificial participants in civil legal relations - and these are not only legal entities, but also the state and territorial communities - are not inherently characterised by manifestations of mental activity. According to scholars, to some extent, this was overcome by the perception of the guilt of a legal entity in the actions of its employees, whose attitude to the performance of their labour duties is in the mental plane. However, such an explanation is extremely vulnerable, especially when a decision on certain actions is made by a collegial body of a legal entity [12, p. 39]. In addition, this concept cannot be applied to the actions of public law entities as participants in civil legal relations, so the concept of fault for bringing to civil liability does not always work. In this regard, let us recall the concept of the British legal school, which does not support the psychological concept of guilt, considering it as a deviation from the standard of proper behaviour, rather than a mental attitude to the act. [13, p. 531].

The balance between these two views on the nature of fault as a condition for civil liability has been found, to some extent, in Ukrainian civil law doctrine and legislation, since a person is innocent if he or she proves that he or she has taken all measures in his or her power to properly fulfil an obligation (part 1 of Article 614 of the Civil Code of Ukraine).

If we are talking about the traditional concept of legal liability, it can be adapted to the realities of the virtual world, provided that it defines the place of actors acting in this world as objects or subjects. And here it becomes clear that the virtual world requires both the emergence of new types of objects in the legal field (which is already a reality given the emergence of the category of digital things in the Civil Code of Ukraine, intellectual property in the digital sphere (copyright to digital works, programs and databases, Internet trademarks, patents for digital

inventions, non-fungible tokens (NFTs)), data, electronic documents, contracts executed through smart contracts, etc.), and, obviously, new types of subjects, if not now, then in the near future.

The emergence of the virtual space has caused a number of problems related to the need to revise traditional categories, in particular in law. Increasingly, legal scholars are faced with the impossibility of adapting established legal categories and constructs to the digital space. Obviously, the digital space needs rules that would regulate the relations that develop in virtual reality, taking into account the specifics of the intangible world. The problems faced by lawyers in connection with the proliferation of information technology prompt them to search for new, unconventional solutions. Regulation by analogy, adapting the problems of the digital space to the material world, is not always effective, as traditional models, even in the form of legal fictions, are not applicable to all situations. For example, new objects of law (digital things, digital assets, etc.) are emerging, and problems arise with determining the rights to intellectual property generated by artificial intelligence. The emergence of artificial intelligence has changed the attitude to intelligence, which for a long time was considered a property inherent exclusively to biological beings, i.e. *homo sapiens*. In 1956, when the concept of artificial intelligence was introduced, discussions began about whether intelligence could be more than just an inherent feature of a biological being, i.e. whether it could be created artificially. AI can be defined on the basis of the thinking human factor and in terms of rational behaviour: 1) systems that think and act like humans; 2) systems that think and act rationally. These factors demonstrate that AI differs from conventional computer algorithms. These are systems that can learn (store their personal experience). This unique feature allows AI to act in different ways in the same situations, depending on its previous actions. The ability to accumulate experience and learn from it, as well as the ability to act independently and make individual decisions, creates prerequisites for causing harm [14]. Therefore, one of the issues that needs to be addressed is the responsibility of artificial intelligence.

It should be noted that discussions about the subjectivity of artificial intelligence are quite active in the scientific community and have both supporters and opponents. These positions on the use of artificial intelligence, its subjectivity and its responsibility for actions can be grouped into two broad groups: 1) positioning of artificial intelligence robots as an object of social relations, where the subjects are individuals and legal entities; 2) positioning of artificial intelligence robots as separate subjects of legal relations. Under this approach, artificial intelligence robots are perceived as separate independent subjects of social relations with the ability to relatively independently and sufficiently understand and assess the significance of their actions and the actions of others.

In addition, the European Parliament in its Recommendations on civil law rules in the field of robotics stated: «There is a need for a commonly accepted definition of robot and AI that is flexible and does not hinder innovation» [15]. It should be noted that the Recommendations use two terms: “robot” and “artificial intelligence”, which are not distinguished. The document also refers to “manifestations of artificial intelligence”, but no definitions are provided.

In order to establish the possibility of recognising the subjectivity of artificial intelligence, and therefore to bear independent responsibility for its own actions, we believe that we should refer to the definition of this category. However, according to Jonas Schuett, the material scope of artificial intelligence regulation should not depend on the term “artificial intelligence (AI)”. The argument is developed by proposing a number of requirements for legal definitions, reviewing existing definitions of AI and discussing how they meet the proposed requirements. The author notes that existing definitions of AI do not meet the most important requirements for legal definitions and argues that a risk-based approach would be more appropriate. Instead of using the

term AI, policymakers should focus on the specific risks they want to mitigate. It is shown that the requirements for legal definitions can be better fulfilled by identifying the main sources of relevant risks: certain technical approaches (e.g. reinforcement learning), applications (e.g. facial recognition) and capabilities (e.g. the ability to physically interact with the environment) [16].

However, in our opinion, the definition of artificial intelligence is crucial.

Thus, the Concept for the Development of Artificial Intelligence in Ukraine defines artificial intelligence as «an organised set of information technologies that can be used to perform complex tasks by using a system of scientific research methods and algorithms for processing information received or independently created during work, as well as to create and use its own knowledge bases, decision-making models, algorithms for working with other entities and determine ways to achieve the tasks set» [17].

O. Kostenko proposes to define it as “a complex information system of machine learning based on artificial neural networks that process big data, generate statistics and scenarios of the processes under study in order to predict their development for the final decision-making by a person” [18].

According to O.A. Baranov, artificial intelligence is a certain set of methods, techniques, tools and technologies, primarily computer-based, that imitates (models) cognitive functions that have criteria, characteristics and indicators equivalent to those of the corresponding human cognitive functions. [19, p. 45].

Thus, we are dealing with a multivariate definition of artificial intelligence, but the main question to be answered is whether artificial intelligence is an object or a subject of law? The question of whether certain AI systems should acquire legal personality has been the subject of considerable debate in legal studies. Some experts believe that instead of recognising the legal personality of AI, existing models of liability should be modified to impose legal responsibility for the actions of autonomous AI systems on their users and manufacturers. Proponents of this position refuse to recognise the legal personality of AI, emphasising that the legal challenges it poses can be resolved by creating an organisation or entity with legal personality, such as a limited liability company or a private entrepreneur who uses AI in his or her business.

Arguments against recognising AI as a legal entity focus on several key aspects. First, artificial intelligence is not a person, and therefore cannot have rights and obligations. Second, there are certain limitations on its legal status. Third, it has negative characteristics that make it incompatible with traditional concepts of legal personality.

In addition, some scientific studies point to serious legal consequences of the possible recognition of the legal status of AI. Granting it rights or imposing obligations on it may cause an insurmountable conflict between reality and law. Thus, this creates a legal paradox that currently does not allow recognising the legal personality of artificial intelligence [20].

However, there is also a large group of scholars who believe that AI can be recognised as a legal entity, namely a derivative legal entity similar to a legal entity. This approach is based on the theory of legal fiction and the theory of bodies in legal entities [21].

Recognition of artificial intelligence as a subject of legal relations opens the way to granting it, in particular, the status of a subject of a criminal offence and legal personification in other branches of law [22].

Ben Allgrove explores the concept of legal personality and concludes that legal personality determines who is “counted” for the purposes of the law. The impact of artificial intelligence technology provides a unique opportunity to take a fresh look at this often misunderstood legal

concept. He concludes that (a) there is no theoretical barrier to attributing legal personality to bots; (b) whether this should be done is determined by the extra-legal (moral, philosophical, historical, economic, political, social, etc.) considerations prior to the attribution of legal personhood; and (c) it is too early to conclude that legal personhood should be granted to artificial intelligences, although there are already significant pragmatic arguments in favour of doing so [23].

The study of the legal personality of artificial intelligence, according to Dema Matruk Aloun and Bakhit Moh'd al Dajeh, examines whether artificial intelligence should be granted rights and obligations similar to those of natural persons or corporations. Key aspects include challenges such as the lack of physical presence of artificial intelligence, as well as debates over its agency and autonomy. Proponents of this idea believe that granting AI legal personality could increase accountability, foster innovation, and protect AI interests. Some countries have already made some progress in recognising artificial intelligence legally, although ethical issues remain relevant. An alternative to full legal personality could be to create new legal classifications or focus on regulating AI developers and users [24].

3. Existing and prospective models of civil liability of artificial intelligence

The problems of civil liability of artificial intelligence now need to be addressed in view of the real risks that humanity faces in everyday life: damage caused by autonomous vehicles, medical or household artificial intelligence systems. The question is already arising as to whether current civil liability regimes provide a sound basis for addressing the problems associated with harm caused by artificial intelligence systems, especially those based on machine learning. We seek to answer three questions: Is there a place for fault-based liability when it is impossible to determine whose actions caused harm among many actors? Are existing strict liability regimes suitable for dealing with harm caused without fault by AI systems, or is a new system needed? When should an agent be exempt from liability?" [25]

The question also arises as to whether civil liability institutions can be adapted to the new generation of robots, which will be equipped with learning abilities and have a certain degree of unpredictability in their behaviour. Therefore, research on the concept of AI liability for damage and bodily injury is not only relevant, but also critically necessary. Existing civil liability institutions are not yet sufficiently prepared to address the legal issues that will arise when self-driving vehicles or autonomous drones start operating in fully autonomous modes and possibly cause property damage or bodily injury.

However, there is also a view that, rather than considering new principles of liability (solutions that require some change to existing liability regimes), consideration should be given to simply adapting existing fault-based liability regimes with enhanced duties of care and clarifications on joint liability and solidarity between tortfeasors, which can potentially be done through case law in most jurisdictions [26].

Thus, it is necessary to analyse these issues in detail.

Speaking about the civil liability of artificial intelligence, it is necessary to analyse, first of all, the decisions contained in regulatory documents. For example, the aforementioned Resolution on the civil law regulation of robotics with recommendations to the European Commission of 16 February 2017 pays a lot of attention to civil liability. In particular, it is stated that "...under the current legal framework, robots cannot be held liable per se for actions...that cause damage to third parties (para. ad) and that "at this stage, liability should be assigned to humans" [27]. Clause "ad" also states that a person, the so-called "agent", is responsible for the actions of AI. It can be the

creator, owner, user, operator and other entities that use it. In order to establish legal liability, it is necessary to prove the guilt of a person who could have foreseen and prevented such damage, and in this regard, the introduction of a mandatory insurance system against negative consequences and damage is enshrined.

Paragraph 59 of the Resolution contains a recommendation that robots may be granted a special legal status of “electronic person” (personality). In fact, it is about granting legal status to smart robots that can independently establish relationships with the environment and change their actions depending on the situation. According to the authors of the Analytical Note on Comparative Legislation on the Use of Artificial Intelligence Technologies (State of the Art and Prospects for the Development of EU and Other Legislation), the recommendation to grant robots the legal status of “electronic personality” is explained by the fact that current EU legislation does not provide for the liability of a robot for actions or omissions that cause damage to third parties, but when the cause of such action or omission can be traced to a specific person, such as a manufacturer, operator, owner or user, who could [28].

Further, on 8 April 2019, the AI Expert Group presented the Ethics guidelines for trustworthy AI. The main principle of these guidelines is that AI should be human-centred, i.e. AI systems should be developed, used and monitored in a way that respects fundamental human rights and ethical standards. “Trustworthy AI” requires algorithms that are legal, safe, reliable, and resilient enough to cope with errors or inconsistencies at all stages of the AI system’s life cycle. The Guidelines set out a set of 7 key requirements that AI systems must meet to be considered trustworthy: 1) human rights and oversight; 2) technical reliability and security; 3) privacy and data management; 4) transparency; 5) diversity, non-discrimination and equity; 6) societal and environmental well-being; 7) accountability [29].

The next document was the White Paper On Artificial Intelligence - A European approach to excellence and trust, published on 19 February 2020 (White Paper On Artificial Intelligence - A European approach to excellence and trust [30]), The White Paper aims to outline possible changes that will contribute to the reliable and safe development of artificial intelligence in Europe with full respect for the values and rights of EU citizens. According to scientists, the main content of the White Paper, which was finalised during open discussions, was the basis for the text of the draft European Commission Regulation on the legal regulation of the use of artificial intelligence [31, p. 41].

The document notes that while AI can bring many benefits, including making products and processes safer, it can also cause harm. This damage can be both tangible (safety and health of individuals, including loss of life, damage to property) and intangible (loss of privacy, restriction of the right to freedom of speech, human dignity, discrimination, for example, in access to employment). The main risks associated with the use of AI relate to the application of rules aimed at protecting fundamental rights (including personal data protection and privacy and non-discrimination), as well as security and liability issues. In particular, the AI regulatory framework should focus on minimising various risks of potential harm. The White Paper also notes that the specific characteristics of many AI technologies, including opacity (“black box effect”), complexity, unpredictability and partially autonomous behaviour, may make it difficult to verify compliance and may prevent the effective application of existing EU law to protect fundamental rights [30].

In October 2020, the European Parliament approved a legislative initiative resolution based on Article 225 TFEU on civil liability for AI, requesting the Commission to propose relevant legislation. The Resolution sets out key aspects of protecting users from damage that may be caused by devices and systems that use artificial intelligence. It refers to two regimes of civil

liability for damage caused by artificial intelligence: 1) strict liability; 2) liability based on the principle of fault [32]. It is emphasised that different risks should entail different liability. At the same time, the type of AI system over which the operator exercises control is a determining factor in terms of liability. And, accordingly, it is noted that an AI system that entails inherent high risk and operates autonomously potentially endangers the general public to a much greater extent, so, based on the legal challenges that AI systems pose to existing civil liability regimes, it seems reasonable to establish a general regime of strict liability for these high-risk autonomous AI systems. Such an approach, based on a risk assessment that may encompass multiple levels of risk, should be based on clear criteria and an appropriate definition of high risk, and provide legal certainty [33]. The same document refers to the need to revise the Product Liability Directive (PLD) in the light of digitalisation, which was done later.

In September 2022, the European Commission proposed a Directive on Artificial Intelligence Liability [34], which creates a legal basis for persons affected by the results of an artificial intelligence system to bring legal action against artificial intelligence operators. This directive introduced new procedures for liability for damage caused by artificial intelligence systems.

Firstly, like the Product Liability Directive, the AI Liability Directive recognises the opacity of AI systems and the information imbalance between developers and users or consumers. Both directives shift the burden of proof to developers by introducing disclosure mechanisms and rebuttable presumptions. Users only need to provide plausible evidence of potential harm, while AI operators must disclose all relevant information to avoid liability. Failure to disclose such information will lead to a (rebuttable) presumption that the AI operator has breached its duty of care. This presumption can be rebutted if the AI operator can prove that the duty of care has been fulfilled.

In addition, the AI Liability Directive includes claims against non-professional users of AI systems for causing harm to others and recognises human rights violations as acceptable compensation [34].

At the same time, there is an opinion that “the application of the subsidiarity principle to the European regulation of compensation for damage caused by artificial intelligence requires more than adjusting liability based on fault, with the necessary establishment of compensation funds to compensate for damage caused by high-risk artificial intelligence systems. This conclusion is supported by an analysis of the relationship between the principle of innovation and the precautionary principle in the regulation of artificial intelligence, as well as the specific features of this new digital technology” [35].

The EU Product Liability Directive (PLD) is also an interesting and very useful document. The new Directive came into force on 9 December 2024 and was intended to modernise the outdated rules that had been in force since 1985. The fact is that the 1985 law is not adapted to new product categories, such as connected devices, and the revised rules are intended to enable customers to claim compensation if they have suffered damage due to a defective software update, upgrade or service. The need to revise this Directive from the perspective of comprehensive digitalisation has been repeatedly emphasised in the literature [36]. The proposed product liability rules also put online retailers in the crosshairs, which, according to the rules, could be held liable if they fail to disclose the name of the seller to a person who has suffered damage upon request [37].

In addition, the Directive’s coverage of not only physical goods but also digital products, such as software and software updates that affect the functionality of devices, is a novelty. The Directive clearly classifies artificial intelligence systems as “products”. It also takes into account the risks associated with the integration of artificial intelligence and introduces rules for products

that can change their characteristics after the sale due to future software updates. Consumers are at the centre of the policy, and more favourable conditions have been created for them to file claims for damage caused by defective products. For example, simplified requirements for proving a defect in cases of complex technological products have been introduced, reducing legal barriers for affected persons. The presumption of defectiveness will apply in situations where proving causation requires expert knowledge that is not available to consumers. Thus, citizens will no longer need to prove negligence in case of harm. They only need to show that the AI product was defective and caused harm. This makes it much easier to get compensation. However, these rules only apply to individuals. Companies that have suffered losses due to AI systems cannot use these rules to file claims. However, some EU countries have already introduced relevant rules for companies [38].

According to the new Directive, a product will be considered defective if it does not provide the safety that a person has a right to expect from it or that is required by law.

According to Wouter Torfs and Edwin Jacobs, even at the stage of drafting the Directive, the modification of the concept of a defective product was intended to include characteristics specific to AI, in particular, focusing on the system's ability to continuously learn after launch. By extending the scope of liability to include such cases, the amendment recognises the dynamic nature of AI systems and aims to ensure that liability extends to problems arising from the system's ability to learn continuously [39].

The new rules extend the responsibility to importers, distributors and other supply chains (economic operators), obliging them to ensure the safety of products. Economic operators must also ensure that digital components comply with safety standards throughout the product life cycle [40].

The rules of the Directive apply as a result of one of the main types of damage, such as: 1) death or bodily injury, including physical and psychological harm; 2) damage to property; 3) destruction or corruption of data. The victim has the right to claim compensation for any of the main types of damage and all losses caused by them.

According to the researchers, analysing the provisions of the Artificial Intelligence Liability Directive and the Defective Products Directive, "both directives aim to eliminate the information asymmetry between the parties in liability claims by establishing new rules on the burden of proof. In addition, the proposed Product Liability Directive has been "modernised" by explicitly incorporating new technical developments and ending the debate on software as a product" [41].

A new step towards regulating relations related to artificial intelligence was the adoption of the EU Artificial Intelligence Act (AI Act).

Numerous discussions have been related to this law, including those on the liability of artificial intelligence. But, in the end, it does not contain provisions that would allow individuals to claim compensation for damages caused by AI systems. The European Commission deliberately decided to consider liability for artificial intelligence through the prism of product liability. Thus, the European Union Artificial Intelligence Law has left non-contractual civil liability out of its regulation. It focuses on defining the obligations to be fulfilled by AI systems (compliance) rather than addressing the problems that may arise due to harm caused by such systems. Instead of incorporating non-contractual civil liability into the AI Law, the European Commission decided to regulate it separately in a Directive, as it considers it to be the most appropriate instrument as it provides the desired harmonisation effect and legal certainty. It also believes that the Directive provides flexibility that allows Member States to seamlessly implement the rules into their national liability regimes [42].

4. Possible solutions to the problem of civil liability of artificial intelligence

Artificial intelligence poses a challenge to existing tort law, as it can cause harm by acting independently, and at the same time is not considered a subject of law, i.e., like individuals and legal entities. Theoretically, tort liability for damage caused by artificial intelligence can be considered as vicarious liability, strict liability (regardless of fault), or liability with fault. The term “strict liability” is atypical for classical civil law. According to B. Karnauch, liability regardless of fault is also called “strict liability”, or less commonly “absolute liability”. The latter term is typical, in particular, for international conventions on liability for nuclear damage. The provision of Article 72 of the Law of Ukraine “On the Use of Nuclear Energy and Radiation Safety” is also noteworthy, which explicitly states that absolute liability is liability that “arises regardless of the establishment of guilt”. That is, all three terms are used as equivalent [43, p. 122].

There is also a theoretical possibility of granting legal personality to autonomous artificial intelligence systems (for example, if they are recognised as a quasi-legal entity), which would make it possible to hold them directly liable for the damage they cause. However, this approach does not currently enjoy much support, although it cannot be ruled out in the future. In view of the legislative initiatives of the European Parliament, the most likely approach to civil liability for AI-related damage in the European Union will be based on an assessment of the risk caused by different AI systems and will include liability without fault of the operators of high-risk AI systems, as well as liability with fault of the operators of other AI systems that are not classified as high-risk.

In assessing the existing risks of using artificial intelligence systems and the harm they can cause, researchers analyse the adequacy of existing legal doctrines on private liability in terms of resolving AI-related cases. While existing national laws on liability for damages may be applicable to AI-related harms, there is a risk that the outcome of cases will be unpredictable and controversial, and in some cases, unfair. The assumed level playing field in the single market justifies harmonisation of many aspects of liability for AI-related harm. In this process, the specific characteristics of AI should be carefully considered in terms of issues such as causation and burden of proof [44].

Reform trends are also reflected in the civil legislation of Ukraine. In particular, the Cabinet of Ministers of Ukraine approved Resolution No. 650 dated 17.07.2019 “On the Establishment of a Working Group on Recodification (Update) of the Civil Legislation of Ukraine”, and prepared the Concept for Updating the Civil Code of Ukraine, which, in accordance with § 5.42. The system of special torts. It is advisable to revise the system of special torts provided for in Chapter 82 of the Civil Code of Ukraine. This refers to the need to supplement the current Civil Code of Ukraine with provisions on: (1) compensation for damage caused by malicious software; ...(3) compensation for damage caused by robotics and artificial intelligence [45, p. 51].

The current Civil Code of Ukraine contains special torts, but there is currently no liability for damage caused by robots. Some scholars emphasise the expediency of using the existing provisions of the Civil Code of Ukraine to formulate the rules for the application of civil liability for damage caused by works. At the same time, the entities that will bear this liability will not be legal representatives, but persons who were involved in the creation and programming of the robot: inventors, programmers, manufacturers, etc. [46, p. 89].

There are different points of view regarding the regimes of liability for damage caused by artificial intelligence. In particular, according to E.O. Michurin, if the damage is caused by the activity of a robot with built-in artificial intelligence (relatively independent action programme), the owner of artificial intelligence should compensate for the damage under the rules of liability for damage caused by a source of increased danger, provided that it violates the recommendations of the artificial intelligence manufacturer (violation of the instructions). If the cause of the damage was a defect (setting) of artificial intelligence caused by the manufacturer's fault or the manufacturer failed to warn in the instructions for use of artificial intelligence about its potential harmful properties (which led to the damage), the damage will be compensated under the rules on liability for damage caused by a product defect (product defect). If a consumer purchases a product with artificial intelligence, the following provisions of consumer protection legislation should apply [47, p. 72].

However, the literature quite rightly notes that a robot with built-in artificial intelligence may be not only uncontrollable to the person using it, but also unpredictable. Therefore, it is impossible to apply the rules of compensation for damage caused by a source of increased danger, since its infliction is not covered by the concept of activities that create increased danger to others [48, pp. 20-21].

As Karni Chagal-Feferkorn points out, the traditional legal framework of tort law, which aims to compensate for damages caused by third parties, "knows" how to deal with damages caused by people. They also "know" how to deal with damage caused by machines. In the case of the former, there are several ways to deal with it, the main one being negligence. Under negligence law, individuals (or corporations and other legal entities) who cause damage are liable and obliged to pay the injured party if certain conditions are met. The existing legal framework also "covers" damage caused by products. For cases such as a tyre that explodes while driving, a lawnmower that breaks apart and throws a piece that hits the operator, or even an autopilot system that causes an air accident, the law applies the doctrine of product liability. Under this doctrine, victims can generally recover damages from the manufacturers or sellers of a product if they can prove that there was some kind of defect in the product that caused the injury [49].

Since, in our opinion, a single liability regime for different artificial intelligence systems is impossible, liability without fault should be established for high-risk AI systems. In this case, it is necessary to supplement the current Civil Code of Ukraine with a special rule on liability of artificial intelligence in the process of recodification of civil legislation. Thus, a new type of special tort should be introduced, namely, compensation for damage caused by AI (robots). As noted in the literature, there are all legal grounds for compensation for damage caused by mechanisms, including robots, since Art. 1187 of the Civil Code of Ukraine provides for the rules of compensation for damage caused by a source of increased danger... However, as already noted, the rules on compensation for damage caused by a source of increased danger cannot be applied to compensation for damage caused by artificial intelligence, because the presence of artificial intelligence and the ability to make independent decisions radically change the situation, and there is a need for special legal regulation of these relations [46, p. 89].

Other cases of damage compensation may be subject to the rules on product and service quality liability.

In general, product and service liability requires the existence of the fault principle, i.e. negligence in breach of a legal or contractual obligation, certain or foreseeable damage in the form of lost profits, and a causal link between the act or omission and the damage caused [50].

In the near future, the possibility of assigning legal personality to autonomous artificial intelligence systems in order to impose liability for damage does not seem realistic, although in the long term, this possibility cannot be ruled out [51]. Therefore, it is necessary to develop provisions on the possible legal status of such an entity as an “electronic person” at both the doctrinal and legislative levels, recognising it as a quasi-legal entity and granting it the appropriate scope of tort capacity.

Conclusions

The emergence of the virtual space has caused a number of problems related to the need to revise traditional categories, in particular in law. Increasingly, legal scholars are faced with the impossibility of adapting established legal categories and constructs to the digital space. In particular, these are the problems of civil liability of artificial intelligence, which now need to be addressed in view of the real risks faced by humanity in everyday life: damage caused by autonomous vehicles, medical or household artificial intelligence systems, etc. The problem is compounded by the fact that one of the main aspects of AI systems is their opacity for many outcomes. In many cases, we don't know how the system came to a certain conclusion. For this reason, the classical rules of non-contractual civil liability discussed above do not work in all cases of AI use or make it very difficult for victims to obtain compensation. An analysis of the existing scientific positions and basic regulations in this area has led to the conclusion that the current Civil Code of Ukraine should be supplemented with provisions on: (1) compensation for damage caused by malware; ... (3) compensation for damage caused by robotics and artificial intelligence. Since, in our opinion, a single liability regime for different AI systems is not possible, liability without fault should be established for high-risk AI systems, given that similar solutions have been proposed by scientists and are already in place in the law [52, pp. 345-365]. In this case, it is necessary to supplement the current Civil Code of Ukraine with a special rule on the liability of artificial intelligence already now, in the process of recodification of civil legislation. Thus, a new type of special tort should be introduced, namely compensation for damage caused by AI (robots). Other cases of damage compensation may be subject to the rules on liability for the quality of products and services.

In the near future, the possibility of assigning legal personality to autonomous artificial intelligence systems in order to impose liability for damage does not seem realistic, although in the long term, this possibility cannot be ruled out. That is why it is already necessary to develop provisions at both the doctrinal and legislative levels regarding the possible legal status of such an entity as an AI “electronic person” with recognition of it as a quasi-legal entity and granting it the appropriate scope of tort capacity.

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