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## CIVIL LIABILITY FOR DAMAGE CAUSED BY ARTIFICIAL INTELLIGENCE: THE MODERN EUROPEAN APPROACH

**Abstract.** The *purpose of the article* is to outline the main theoretical concepts and current legislative initiatives concerning tort liability for damage caused by artificial intelligence (AI) in the European Union.

**Research methods.** The methodology of this article relies on such research methods as analysis and synthesis, as well as comparative method.

**Results.** Artificial intelligence poses a challenge to existing tort law, as it can cause damage acting independently and, at the same time, it is not regarded as a legal entity like natural and legal persons. In theory, tort liability for AI-related damage may be viewed as vicarious liability, strict liability, or fault-based liability. There is also a theoretical possibility of granting legal personality to autonomous AI systems, thus making it possible to hold them directly liable for the damage they cause. However, this approach does not have much support at the moment, even though it cannot be ruled out in the future. Considering the legislative initiatives of the European Parliament, the most probable approach to civil liability for AI-related damage in the EU will be based on the assessment of risk posed by different AI systems and will include strict liability of the operators of high-risk AI systems as well as fault-based liability of the operators of other AI systems which are not classified as high-risk.

**Conclusions.** At the theoretical level, it is possible to approach the issue of civil liability for AI-related damage using the concepts of vicarious liability, strict liability, including product liability as well as fault-based liability. At the practical level, it is most likely that the European approach to developing legislation on civil liability for AI-related damage will be based on the assessment of risk and therefore will include a combination of strict liability for damage caused by high-risk AI systems and fault-based liability for damage caused by other AI systems that are not regarded as high-risk. In the near future, the possibility of granting legal personality to autonomous AI systems with for making them liable for damage does not seem realistic, although it cannot be ruled out in the long run.

**Key words:** artificial intelligence, civil liability, damage, tort, electronic person, legal personality.

### 1. Introduction

Nowadays, artificial intelligence (further – AI) is becoming ever more pervasive in all fields of life. The development and application of AI technologies brings about a lot of opportunities and advantages for governments, businesses and individuals along with some challenges. As it is pointed out by the European Commission in its White Paper on Artificial Intelligence, AI will change our lives by improving health-care (e. g., making diagnosis more precise, enabling better prevention of diseases), increasing the efficiency of farming, contributing to climate change mitigation and adaptation, improving the efficiency of production systems through

predictive maintenance, increasing the security of Europeans, and in many other ways that we can only begin to imagine (European Commission, 2020). However, like many other new technologies AI presents a number of risks and challenges stemming from its autonomous, self-learning and unpredictable nature, such as the lack of algorithmic transparency, cyber security vulnerabilities, intellectual property issues, privacy and data protection issues, unfairness, bias and discrimination, lack of accountability for harm, etc. (Rodrigues, 2020).

From the legal perspective, one of the most significant challenges of AI is the potential for causing damage as well as ensuing civil liability for such

damage. The harmful effects of AI may vary from property damage and economic losses in case of AI-powered software providing incorrect financial advice to personal injury and immaterial harm in case of a self-driving vehicle running over a pedestrian. Whatever the nature of AI-related damage, it is essential to understand who will ultimately bear responsibility for it. The law of tort usually provides clear rules on who is liable for damage. However, in case of damage caused by AI systems, it is not always clear how to apply traditional rules of tort liability due to the complexity of such systems, their autonomy, self-learning ability as well as the number of individuals and companies participating in the development, manufacturing and operation of AI systems. In other words, the existing tort law is not always sufficiently clear and effective when it comes to the recovery of damages resulting from the use of AI. For this reason, in recent years there have been numerous efforts on the part of the European Commission and the Parliament to work out specific rules on the liability for damage caused by AI systems in order to supplement the existing civil liability legal regimes. The issue of civil liability for the damage resulting from the application of AI has also been addressed by legal scholars such as B. Schütte, L. Majewski, K. Havu, E. Karner, B. Koch, M. Geistfeld, P. Cerka, J. Grigiene, G. Sirbikyte, and others. Nonetheless, the issue does not appear to be settled for the time being and there is still a lot of room for research and debate. Considering what has already been discussed and published in various studies and proposals, it is important to provide a comprehensive analysis and overview of the relevant issues. Thus, the purpose of this study is to outline the main theoretical concepts and current legislative initiatives concerning tort liability for damage caused by AI in the European Union.

Research methodology relies on such research methods as analysis and synthesis, as well as comparative method. The method of analysis is used for exploring different theoretical concepts of tort liability with regards to AI-related damage. The method of analysis is used along with the method of synthesis, which is applied for building connections between the available concepts of tort liability and their possible future applications for the redress of damage caused by AI. The comparative method of research assists in identifying the advantages and shortcomings of different tort liability concepts as well as legislative initiatives.

## 2. AI as a challenge for the existing tort law

Regardless of whether it is continental or common law system, the general purpose of tort

law comes down to a very simple idea: harm or damage inflicted on a person by another person has to be compensated. As long as this tortious relationship involves natural and legal persons, this principle works well enough. However, there comes a time when damage can be done by intelligent entities that are neither natural persons nor legal persons. Unlike natural and legal persons, AI systems are not regarded as legal entities (subjects of law) in spite of the fact that such autonomous systems are capable of learning, accumulating personal experience and making independent decisions, which is quite similar to what humans do. Therefore, the question arises how should the law deal with the damage caused by these human-like entities capable of acting independently?

In the absence of AI specific legislation covering among other things civil liability for damage caused by AI systems, there is no shortage of theoretical discussions of possible ways to tackle the problem of tort liability for damage caused by AI. Many legal scholars have already addressed this issue. Exploring the entire range of different views on this issue, it is possible to single out the most common approaches to this subject. Tort liability for damage caused by AI may be viewed as: vicarious liability, strict liability or fault-based liability.

## 3. Vicarious liability and AI-related damage

Vicarious liability usually applies to situations where employers are held liable for the torts of their employees, provided these torts took place in the course of their employment (Harpwood, 2000, p. 345). Other examples of vicarious liability include the liability of parents for the harmful acts of their children (Cerka et al., 2015, p. 385) or the liability of a principal for the conduct of an agent (auxiliary) acting under the direction and for the benefit of the principle (Abbot et al., 2019, p. 24).

Vicarious liability has a lot of variations and differences in many countries of continental and common law. Nonetheless, irrespective of national differences the main idea of vicarious liability consists in holding a person liable for the wrongful acts of another person, provided there is a special legal bond between them. The nature of this legal relationship between the person bearing vicarious liability and the person, who actually committed a tortious wrongdoing, has a number of special features. First of all, it is normally presumed that a person who actually caused the damage acted on behalf and for the benefit of a person who is held liable for the damage. In addition, it is also presumed that the tortfeasor acted under the direction or supervision of the person liable for the damage.

Since the concept of vicarious liability hinges on the possibility of holding a benefi-

ciary liable for the wrongdoings of his human helper (auxiliary), it is argued that the same concept can be extended to non-human helpers such as AI systems as well. As it is pointed out in the Report from the Expert Group on Liability and New Technologies, if harm is caused by autonomous technology used in a way functionally equivalent to the employment of human auxiliaries, the operator's liability for making use of the technology should correspond to the otherwise existing vicarious liability regime of a principal for such auxiliaries (Abbot et al., 2019, p. 45). Although this approach seems logical, it raises some further questions.

Even though the notion of vicarious liability implies no personal fault of the liable person the tortfeasor is expected to be at fault notwithstanding. In the case of vicarious liability for the damage caused by AI it means that an AI system has to be at fault. However, is it theoretically possible for an AI system to be at fault if it's not human and is not recognized as a legal entity? If the answer is no, then another question springs to mind – is it time to give AI systems some sort of legal personality?

#### 4. Strict liability and AI-related damage

Another type of tort liability which is widely discussed with regards to AI is the so-called "strict liability". It is noteworthy that this type of liability does not require any fault on the part of a liable person. Instead, strict liability is based on risk, which is why it is often referred to as risk-based liability. The risk may stem from a certain object or activity associated with an increased level of danger (e. g., motor vehicles, wild animals, use of nuclear power, etc.). According to the Comparative Law Study on Civil Liability for Artificial Intelligence, the basis for a risk-based liability independent of fault is not misconduct on the part of some wrongdoer. Instead, it proceeds from the understanding that someone is permitted to use a (particularly) dangerous thing or pursue some risk-prone activity for her own purposes, which is why she should also bear the loss if such risk should materialize (Karner et al., 2021, p. 58).

It is clear that certain categories of AI systems pose a significant risk to human life, health and property. For instance, an autonomous vehicle can run over pedestrian, a self-learning medical software can suggest an incorrect diagnosis or medication, etc. For this reason, many scholars believe that AI systems can be regarded as a source of increased danger and therefore strict liability should apply to damage caused by AI (Cerka et al., 2015, p. 386). In this regard it is impossible to disagree with the Expert Group on Liability for New Technologies, arguing that the advantage of strict liability for the victim is obvious, as it exempts them from having to prove

any wrongdoing within the defendant's sphere, let alone the causal link between such wrongdoing and the victim's loss, allowing the victim to focus instead only on whether the risk brought about by the technology materialised by causing them harm (Abbot et al., 2019, p. 26).

However, a number of other scholars express their doubts as to whether treating AI systems as a source of increased danger is fully justified. They argue that holding liable for damage caused using AI technologies under the rules of compensation for damage caused by a source of increased danger, albeit logical, has its drawbacks (Maydanyk et al., 2021, p. 156). According to M.M. Velykanova when it comes to compensation for damage caused by a source of increased danger, the infliction of such damage occurs in the case of using a particular vehicle, mechanism, equipment, which, although can get out of control, but not able to take autonomous decision. Instead, the feature of AI is its ability to make decisions independently. Consequently, the point is not in its uncontrollability, but also the unpredictability of its actions and causing harm. Accordingly, since such damage is unpredictable, its infliction is not covered by the concept of activities that pose an increased danger to others, in the sense of the Principles of European Tort Law (Velykanova, 2020, p. 195). Acknowledging the importance of this reasoning, it is also necessary to bear in mind that the distinction between uncontrollability and unpredictability is not always evident. Moreover, lack of control often leads to unpredictability. So, at any rate these categories are closely interrelated.

Strict liability for damage has many variations in different countries. However, there is a special form strict liability, provided for in the Product Liability Directive (Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products), which is common for all countries of the European Union (European Union, 1985). As a form of strict liability product liability is imposed on the producers of defective products. If a defective product causes any physical damage to consumers or their property, the injured person shall be required to prove the damage, the defect and the causal relationship between defect and damage, but once this burden of proof is fulfilled, the manufacturer or producer has to provide compensation irrespectively of whether there is negligence or fault on their part (Benhamou, Ferland, 2020, p. 5).

At first sight, the application of product liability to the producers of AI systems may seem like a viable approach. However, it has its drawbacks

as well. In particular, some researchers point out the fact that AI may not be considered a “product”, despite its broad definition in Product Liability Directive. According to Y. Benhamou and J. Ferland product liability generally only concerns tangible movables (such as hardware), not services; key modern technologies such as software and algorithms are most often considered services, not products (Benhamou, Ferland, 2020, p. 9).

Furthermore, P. Cerka, J. Grigiene, G. Sirbikyte make a good point, arguing that “in some cases it would be difficult to apply the product liability case, because AI is a self-learning system that learns from its experience and can take autonomous decisions. Thus, for the plaintiff it would be difficult to prove an AI product defect and especially that the defect existed when AI left its manufacturer’s or developer’s hands. It is hard to believe that it is possible to draw the line between damages resulting from the AI will, i.e. derived from self-decision, and damages resulting from product defect; unless we would equate the independent decision-making (which is a distinctive AI feature) with a defect” (Cerka et al., 2015, p. 386).

Nonetheless, despite its shortcomings the concept of product liability may serve its purpose in relation AI in certain circumstances. For example, it is quite possible to imagine a situation with a self-driving car bumping into a shop window due to a faulty sensor. In this case the damage occurred as a result of a physical defect in the tangible component of an AI system that can be regarded as a movable product.

#### **5. Fault-based liability and AI-related damage**

Apart from vicarious and strict liability with all their variations, fault-based liability should also be considered with regards to damage caused by AI. After all, fault-based liability is the sort of tort liability that is applied by default in all European jurisdictions, if there are no specific provisions providing for vicarious or strict liability for certain categories of torts. In other words, this type of tort liability is a sort of backup liability in the absence of alternatives (Karner et al., 2021, p. 38).

As it is rightly observed by E. Karner and B.A. Koch, due to the wide range of possible applications of AI, it is clear from the outset, though, that not all of them may be deemed sufficiently dangerous to qualify as an obvious candidate for risk-based liability (Karner et al., 2021, p. 59). This observation provides some food for thought as well as grounds for making a conclusion that strict liability may not always be appropriate with regards to damage caused by AI. In the event of damage caused by an AI system that is not regarded as high-risk it might

make more sense to apply tort liability based on fault.

In practice, the majority of torts do require some proof of fault (Elliott, Quinn, 2009, p. 6). Fault-based tort liability is imposed in case of misconduct where there is a wrongful action (inaction) on the part of the tortfeasor. The wrongfulness of misconduct results from the breach of a duty of care (negligence). A duty of care is a legal obligation that requires adherence to a standard of reasonable care while performing any acts that could foreseeably harm others (Kenton, 2021).

According to some studies, the duty of care in case of AI should be enhanced. In particular, Y. Benhamou and J. Ferland point “out that instead of considering new liability principles <...>, one should consider simply adapting current fault-based liability regimes with enhanced duties of care” (Benhamou, Ferland, 2020, p. 20). In this connection, the report of the Expert Group on Liability and New Technologies suggests that operators of emerging digital technologies should comply with an adapted range of duties of care, including with regard to the choice of technology (choosing the right system for the right task and skills), monitoring and maintaining the system (including safety checks and repair) (Abbot et al., 2019, p. 44).

#### **6. Legal personhood of autonomous AI systems and AI-related damage**

Aside from the use of existing tort liability regimes for redressing the damage caused by AI, there is also an alternative option to address this issue by way of granting legal personality to autonomous AI systems. The implementation of this drastic idea would give autonomous AI systems a legal status of “electronic persons” similar to that of legal persons. In this case an AI system could be directly liable for any damage it might cause.

Although this idea may seem quite shocking at first sight, in reality an autonomous AI system with its inherent ability to learn and make independent decisions has even more reasons to be recognized as a legal entity than a corporation, which is a pure legal fiction. With regards to liability for damage the legal personhood of AI systems could solve at least one of the existing problems – it would make it easier to identify a person responsible for the damage instead of trying to figure out who is to blame for it among the designers, manufacturers, operators and users of AI.

However, the notion of AI systems’ legal personhood has not gained much support yet. On the contrary, some legal researchers point out potential difficulties of holding AI systems as legal entities liable for the damage they caused. In particular, it is argued that grant-

ing legal personhood to AI systems would require significant legislative steps, and intricate legal and practical questions would need to be addressed in terms, for instance, of funds “governed” and “owned” by an AI application or a robot (Schütte et al., 2021, p. 15). Additionally, there are concerns that unlike corporations AI may not have funds of its own to indemnify its potential victims even if it is found liable for damage (Benhamou, Ferland, 2020, p. 11).

### **7. Legislative initiatives for AI-related tort liability in the EU**

Although there is no currently specific legislation on tort liability for damage caused by AI in Europe, there have been some initiatives to establish a common EU legal framework for AI in recent years. In particular, these legislative initiatives include proposals concerning tort liability for damage caused by AI systems. In this regard, at least two resolutions of the European Parliament need to be mentioned. One of them is the European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (European Parliament, 2017).

Civil liability for damage caused by AI-powered robots is one of the main issues addressed in this resolution. First of all, the European Parliament suggests that the European Commission should determine whether to apply strict liability or the risk management approach when elaborating future legislative instruments. In addition to this, the possibility of introducing a compulsory insurance scheme for the producers of autonomous robots as well as the establishment of a special compensation fund are also contemplated in the resolution.

It is not surprising that the idea of imposing strict liability for damage caused by AI is combined with the idea of providing civil liability insurance for the producers of AI systems. The thing is that strict liability usually comes with some sort of compulsory insurance of the liable person (e. g. civil liability insurance of motor vehicles’ owners). As for the proposal to establish a compensation fund, it can be regarded as a supplementary measure, since such a fund is supposed to ensure compensation for damage caused by autonomous AI systems if there is no insurance cover.

The most interesting part of this resolution calls on the Commission to consider the possibility of creating a specific legal status for robots in the long run, so that at least the most sophisticated autonomous robots could have the status of electronic persons responsible for redressing any damage they may cause (European Parliament, 2017). As it has already been observed the notion electronic persons appears to be quite controversial at present.

In part, this idea does not enjoy much support at the moment, because there are other more traditional ways of dealing with the compensation of damage caused by AI. Nonetheless, it should be emphasized that the creation of such a legal status for autonomous AI systems cannot be ruled out in the future, particularly when AI reaches the level of general human intelligence or superintelligence, exceeding the human level.

In October 2020, the European Parliament adopted another important resolution with recommendations to the Commission on a civil liability regime for artificial intelligence (European Parliament, 2020). The general approach of this resolution to civil liability for damage caused by AI is based on the degree of risk posed by different AI systems. According to this resolution, the type of AI-system the operator is exercising control over is a determining factor regarding liability. It is repeatedly emphasized that an AI-system that entails a high risk potentially endangers the user or the public to a much higher degree and in a manner that is random and goes beyond what can reasonably be expected. Thus, high-risk AI systems are distinguished from other systems driven by AI (such high-risk AI systems are listed in the relevant Annex to the proposed Regulation laying down harmonized rules on artificial intelligence) (European Commission, 2021). It is for this reason that damage caused by high-risk AI system must give rise to strict liability.

At the same time, in accordance with the draft Regulation proposed in the 2020 Parliamentary resolution, AI systems that are not listed as high-risk systems in the relevant Annex should remain subject to fault-based liability, unless stricter national laws and consumer protection legislation are in force (European Parliament, 2020). Thus, the European Parliament suggests a hybrid approach to civil (tort) liability for damage caused by AI systems combining strict liability and fault-based liability. This approach is meant to be flexible enough taking into account the degree of risk posed by different AI systems.

However, even such a hybrid approach is not perfect. Some of the proposals in the resolution are quite contradictory. In particular B. Schütte, L. Majewski, K. Havu draw attention to the fact that the idea put forward by the Parliamentary Resolution, that is, using both a very general notion of high-risk systems and simultaneously an exhaustive list of such systems does not appear recommendable because such a solution would endanger both flexibility and legal certainty. In addition, future civil liability for AI-related damage and the existing product liability regime need to be harmonized, since the Product Liability Directive provides for

the liability of a producer whereas the Parliamentary Resolution envisages the liability of an operator (Schütte et al., 2021, p. 28, 30).

### 8. Conclusions

Summing up the above, it is necessary point out that at the theoretical level of civil law, there are many possible ways of dealing with the liability for damage caused by AI systems. In theory, it is possible to approach this issue using the concepts of vicarious liability, strict liability, including product liability as well as fault-based liability. It is also possible to grant legal personality to autonomous AI systems and hold them directly responsible for the damage they may cause. At the prac-

tical level, judging from the legislative initiatives of the European Parliament, it is most likely that the European approach to developing legislation on civil liability for AI-related damage will be based on the assessment of risk and therefore will include a combination of strict liability for damage caused by high-risk AI systems and fault-based liability for damage caused by other AI systems that are not regarded as high-risk. At the same time, in the near future the possibility of granting legal personality to autonomous AI systems with a view to making them liable for damage does not seem realistic, although it cannot be ruled out in the long run.

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## ЦИВІЛЬНО-ПРАВОВА ВІДПОВІДАЛЬНІСТЬ ЗА ШКОДУ, ЗАВДАНУ ШТУЧНИМ ІНТЕЛЕКТОМ: СУЧАСНИЙ ЄВРОПЕЙСЬКИЙ ПІДХІД

**Анотація. Мета статті** – викласти основні теоретичні концепції та актуальні законодавчі ініціативи щодо деліктної відповідальності за шкоду, заподіяну штучним інтелектом, у Європейському Союзі.

**Методи дослідження.** Методологія роботи передбачає використання таких методів дослідження, як аналіз і синтез, а також порівняльного методу.

**Результати.** Штучний інтелект становить виклик для наявного деліктного законодавства, оскільки він може завдати шкоди, діючи самостійно, і водночас не розглядається як суб'єкт права, тобто як фізичні та юридичні особи. Теоретично деліктна відповідальність за шкоду, пов'язану зі штучним інтелектом, може розглядатися як субсидіарна відповідальність, сувора відповідальність (незалежно від вини) або відповідальність за наявності вини. Є також теоретична можливість надання правосуб'єктності автономним системам штучного інтелекту, що дасть можливість покласти на них пряму відповідальність за завдану ними шкоду. Однак на цей час такий підхід не має великої підтримки, хоча його не можна виключати в майбутньому. З огляду на законодавчі ініціативи Європейського парламенту найбільш вірогідний підхід до цивільної відповідальності за шкоду, пов'язану зі штучним інтелектом, у Європейському Союзі базуватиметься на оцінці ризику, спричиненого різними системами штучного інтелекту, і включатиме сувору відповідальність операторів високоризикових систем штучного інтелекту, а також відповідальність за наявності вини операторів інших систем штучного інтелекту, які не класифікуються як високоризикові.

**Висновки.** На теоретичному рівні можна підійти до питання цивільної відповідальності за шкоду, пов'язану зі штучним інтелектом, із використанням концепцій субсидіарної відповідальності, суворої відповідальності (незалежно від вини), включно з відповідальністю за товари, а також відповідальності за наявності вини. На практичному рівні найбільш вірогідно, що європейський підхід до розроблення законодавства про цивільно-правову відповідальність за шкоду, пов'язану зі штучним інтелектом, базуватиметься на оцінці ризику, а отже, включатиме поєднання суворої відповідальності за шкоду, завдану системами штучного інтелекту з високим ризиком, і відповідальності за шкоду, спричинену іншими системами штучного інтелекту, які не вважаються високоризиковими. У найближчому майбутньому можливість закріплення правосуб'єктності за автономними системами штучного інтелекту з метою покладення на них відповідальності за шкоду не виглядає реалістичною, хоча в довгостроковій перспективі таку можливість не можна виключати.

**Ключові слова:** штучний інтелект, цивільно-правова відповідальність, шкода, делікт, електронна особа, правосуб'єктність.

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