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Civil liability regime for AI-powered decision support systems in EU's Eastern Partnership – Ukrainian case

Reżim odpowiedzialności cywilnej za systemy podejmowania decyzji wspomagane sztuczną inteligencją w krajach Partnerstwa Wschodniego UE – przypadek Ukrainy

Abstract

The main problem considered in the article is to determine how to adequately respond to changes in the functioning of AI-powered decision support systems in terms of satisfying state, business, and citizens' needs. The research methodology is based on the review of the literature on the subject and the analysis of different policy options. The process of argumentation consists of two essential elements. The first characterizes the essence and purpose of the development of civil liability regimes for AI-powered decision support systems in Ukraine. Ukrainian legal provisions were analyzed in terms of their substantive scope and their openness to internalize potential new situations relating to claims for compensation of damages from AI systems. The second part focuses on the results of own research of legal acts and strategic policy documents. The research reveals significant differences between EU regulations and Ukrainian lawmaking practice. An option with the adoption of specific legislation could potentially be a favorable solution. First of all, a risk-based approach ensures appropriate management of risks that would arise for economic actors, and provide a good opportunity for victims to receive compensation. Further implementation of civil liability for AI requires both: the unification of the regulations and a strategic perspective of various regime interoperability. This creates the need to develop and implement a long-term strategy in order to strike a balance between protecting citizens from possible harm caused by the activities of artificial intelligence systems and enabling technological innovation. Different policy options and legislative regimes have been proposed for EU neighboring countries.

Keywords: artificial intelligence, fault-based liability, strict liability, vicarious liability

JEL: C44, O38

Streszczenie

Głównym problemem rozważanym w artykule jest określenie, w jaki sposób odpowiednio reagować na zmiany w funkcjonowaniu systemów wspomagania decyzji opartych na sztucznej inteligencji pod kątem zaspokajania potrzeb państwa, biznesu i obywateli. Metodologia badań opiera się na przeglądzie literatury przedmiotu oraz analizie różnych opcji polityki. Proces argumentacji składa się z dwóch zasadniczych elementów. Pierwszy charakteryzuje istotę i cel rozwoju systemów odpowiedzialności cywilnej dla systemów wspomagania decyzji opartych na sztucznej inteligencji na Ukrainie. Przeanalizowano ukraińskie przepisy prawne pod kątem ich zakresu merytorycznego i otwartości na internalizację ewentualnych nowych sytuacji związanych z roszczeniami o odszkodowanie od systemów AI. Druga część skupia się na wynikach własnych badań aktów prawnych i strategicznych dokumentów polityki. Badania ujawniają znaczne różnice między regulacjami UE a praktyką prawodawczą na Ukrainie. Przyjęcie podejścia opartego na ryzyku zapewnia odpowiednie zarządzanie ryzykiem podmiotów gospodarczych, a poszkodowanym daje okazję do otrzymania odszkodowania. Dalsze wdrożenie odpowiedzialności cywilnej za działania oparte na AI wymaga zarówno ujednolicenia przepisów, jak i strategicznej perspektywy interoperacyjności różnych reżimów. Stwarza to potrzebę opracowania i wdrożenia długoterminowej strategii w celu znalezienia równowagi między ochroną obywateli przed ewentualnymi szkodami a umożliwieniem innowacji technologicznych. Krajom sąsiadującym z UE zaproponowano różne warianty polityki i systemy prawne.

Słowa kluczowe: sztuczna inteligencja, odpowiedzialność na zasadzie winy, odpowiedzialność ścisła, odpowiedzialność zastępcza

Introduction

Most countries do not currently have a specific civil liability regime for artificial intelligence. Main peace of law was adopted more than 30 years ago and it provides for the liability of producers for damage caused by a defect in their product and the rights of consumers. For example, the EU law framework on liability is based on the highly harmonized EU rules on the liability of the producer of "a defective product (the Product Liability Directive 85/374/EEC). When it comes to the substantive rules relating, for example, to accidents, national rules on liability and the calculation of damages for victims apply.

In line with the Association Agreement between EU and Ukraine through the Digital Europe and Horizon Europe programmes, the Commission probably invests in building common civil liability rules in neighboring countries. According to the European Union vision, the rules of civil liability have a dual role in society: firstly, they ensure that victims of damage caused by other people are compensated and, secondly, they provide economic incentives for the responsible party to avoid causing such damage (European Parliament, 2020a). Some of the interesting questions in this context is whether Ukraine should completely redesign its "liability" institutions, which are based on the common Soviet system of law, or whether some make up changes would suffice to fill the gap.

According to a study by Stanford University and "AI Readiness Index 2020" by Oxford Insights, Ukraine has the largest number of companies developing AI technologies. One of the tasks set by the Ukrainian government is to enter the top 10 countries with the highest development of AI in the world based on international indicators (Oxford Insights, 2020; Stanford University, n.d.).

This article raises the question of civic responsibility for the harm caused by the autonomous intelligent system through a qualitative approach based on EU methodology classifying legal provisions. Based on the concept of artificial intelligence, Ukrainian legal provisions are analyzed in terms of their substantive scope and, in particular, their openness to internalize possible new situations relating to claims for compensation of damages from AI systems.

Theoretical background for strict and fault-based liability rules

A closer look at the literature on civil liability regimes for AI, however, reveals a number of gaps and shortcomings. In cases involving the use of systems equipped with artificial intelligence, a discussion on the organization of civil liability can be very difficult as the devices of machines are very diverse. Most scholars examine different AI concepts in the context of fault-based and strict liability regimes not taking into account the economic impacts of those regimes (Čerka, 2015; Yaniv, 2020; Binda Filho &Vetis Zaganelli, 2020). Other scholars are focused on the legal consequences of data protection (Goodman & Flaxman 2016; Wachter et al., 2017; Selbst & Powles 2017; Malgieri & Comandé 2017).

Trying to find an interplay between liability and innovation, scholars suggest the problem is highly nuanced, and specificities of the liability rules (i.e. strict or fault-based system) could be decisive factors, impacting – positively or negatively – the investments in product safety and the timing of market introduction. However, the strength of intellectual property (IP) rights also play "a considerable role on the innovation and liability risks (Galasso & Luo, 2018; Dawid, 2019).

AI algorithms are often divided into two types:
● machine learning algorithms, including classification and regression;
● deep learning algorithms that employ deep neural nets.

Thus, algorithmic models are emerging as the subject of intense scientific and political debate over the legitimacy and accountability of advanced machine learning applications (Reed et al., 2016; Calo, 2016; Selbst, 2020).

In the current debate on the civil liability regime for AI, one of the key points of discussion relates to the choice of approach for AI based systems. The majority of prior research has applied a mix of fault-based and strict liability provisions. Fault-based liability is a general presumption in most legal systems, whereas strict liability provisions are a narrow set of exceptions. In order to contribute to the current debate on the desirable mix of the fault and strict liability for emerging economies, this article focuses on the analysis of national provisions on strict liability.

The basic concept of fault-based liability is that a person is required to compensate for losses caused by his or her fault or negligence. Strict liability or no-fault liability rules, instead, place significant responsibility on the person subject to the rules of liability and facilitate the victim to recover damages. Damages are remedies for material or non-material harm to a legally protected right. The type of recoverable damages and the scope of the compensation depends on the type of the liability claim and a specific jurisdiction. Broadly speaking, damages can be compensatory (compensating for actual harm to health or property) and punitive (mainly aimed at preventing and deterring risky behavior in the future). Compensatory damages are further categorized into damages that cover economic loss (pecuniary damages) and non-economic (non-pecuniary) loss.

Moreover, the European Parliament resolution on civil law rules on robotics states that a future EU legislative approach on liability should be based on detailed analysis "determining whether the strict liability or the risk management approach should be applied" (European Parliament, 2017). There are four main cases where strict liability applies: injuries by wild animals; 'things' liability; abnormally dangerous activities, vicarious liability (Čerka, 2015; European Parliament, 2020b).

Analysis of Ukrainian general rules on strict liability

The main aim of the legal analysis is to help understand what are the defining features or qualities on the basis of which Ukrainian legislation determines what falls within the scope of the strict liability provisions. The underlying questions are

whether, and to what extent, AI systems would fit into any of the existing categories of strict liability provisions. The legal analysis of national law is organized along four main groups of strict liability provisions (injuries by wild animals; 'things' liability; abnormally dangerous activities; vicarious liability) (European Parliament, 2017) that are found in national law.

During our analyses, for better compatibility we would use the European Parliament scale (European Parliament, 2020b): national provisions also cover 'things' other than defective objects; national law also covers intangible things; national law includes a general clause related to strict liability; national law includes specific clauses, for specific types of things (Table 1).

Strict liability for 'things' covers situations where damage is caused by a specific thing. Ukrainian legislation and practice distinguish tangible and intangible 'things'. "A product is a tangible item that is put on the market for acquisition, attention, or consumption, while a service is an intangible item.

For example, you will not find the definition of the term 'cloud services' in either tax or accounting legislation. However, tax accounting is completely focused on accounting and considers such an operation as a service (paragraph 14.1.203 Tax Code of Ukraine). At the same time, further development of artificial intelligence in Ukraine is reflected in the Order of the Cabinet of Ministers of Ukraine of December 2, 2020 No. 1556-r, which approved the Concept of Artificial Intelligence in Ukraine.

The concept defines artificial intelligence as an organized set of information technologies which can perform complex tasks by using a system of scientific research methods and algorithms for processing information obtained or independently created during work, as well as creating and using their own knowledge bases, and decision-making models. Algorithms are used for working with information and identifying ways to achieve goals. Based on such an approach, some Ukrainian scholars (Baranov, 2017; Katkova, 2017; Androshchuk, 2020) pointed out that artificial intelligence is a software product similar to "a computer program, and the legal regulation of artificial intelligence can be applied by analogy with the regulation of a computer program. This, however, is mostly "a simplification because AI requires a foundation of specialized hardware and software for writing and training machine learning algorithms.

Taking into account huge AI hardware, software and staffing cost, many vendors are providing access to artificial intelligence as a service. Such a service approach is being applied to AI-powered decision support systems Artificial Intelligence-as-a-service (AIaaS) and AI Platform-as-a-Service (AIPaaS). Today, machine learning is the leading type of AI. It is the most mature of several areas of AI.

Thus, AI-as-a-Service typically refers to any advanced software package with built-in intelligence to mimic or replicate human thinking.

AIPaaS provides access to a cloud platform where users can avail of the services required on a pay-per-use or pay-per-service basis. AIPaaS often include managed sub-services and third-party APIs, thus providing a more autonomous human (data scientist) intervention and comprehensive platform. An example is the use of such kind of services for autonomous vehicles. Furthermore, in identifying the properties of self-learning in artificial intelligence, it is assumed that human control is lacking and consequently the question arises as to who is responsible for failures of this autonomous intelligence.

Regarding the legislation of Ukraine, it should be assumed that the concepts of "damage" and "loss" do not coincide. "Loss" in its legal meaning established by Art. 22 of the Commercial Code of Ukraine (2003), is a narrower concept than that of "damage" as it only includes real losses and lost profit and they are reimbursed, as a rule, in the presence of property relations and in monetary terms. "Damage", instead, is a broader concept which is divided into a property and non-property damage (Buhaichuk et al., 2015, p. 38).

According to paragraph 1 of the Art. 224 of the Commercial Code of Ukraine, a participant in economic relations who has violated an economic obligation or established requirements for economic activity, must compensate for the damage caused to the entity whose rights or legitimate interests are violated. General provisions related to damage from defective things are applied in Ukraine based on the Law "On liability for damage caused by a defect in the product" (2011). Some specific provisions relate to damage from specific things, such as buildings, and those specific provisions are not limited to defective things are included in articles of the Code of Ukraine on Administrative Offenses (1984).

Thus, reimbursement involves the recovery of damages caused from the guilty party (individual or legal entity). Also, Ukrainian scholars point out that there is a single position in judicial practice, according to which the application of an economic sanction in the form of damage reimbursement requires the

Table 1

Main groups of strict liability in Ukraine

Provisions / Main groups	Cover 'things' other than defective things	Cover intangible things	General clause	Specific clauses
Injuries by wild animals	Not applied	Not applied	+/–	+
'Things' liability	–	+	+	–
Abnormally dangerous activities	Not applied	–	+	+
Vicarious liability	Not applied	Not applied	+	–

Source: own research.

presence of all elements of the offense's corpus delicti, namely: illegal behavior, action or omission, a negative result of such behavior (damages), the causal relationship between illegal behavior and damages, and the guilt of the offender. Where one or more those elements are missing, there is no civil liability (Pavliuchenko & Koshevets, 2015, p. 36; Judgment by the Supreme Court, 2018; Order of the Trial Chamber on Commercial cases of the Supreme Court of Ukraine, 2017; Order of the Central Commercial Court of Appeals, 2019).

Such provisions open the opportunity to apply strict liability for "things" beyond specific cases explicitly mentioned in the law. However, it is questionable whether this is relevant for services, such as cloud software, an algorithm, or any other element or application of AI systems. It should be pointed out that additional provisions relating to "services" or "activities" would be mandatory.

Trying to concentrate on the second type of special liability clause, related to dangerous activities, we can find two specific acts: the Cabinet of Ministers' Order "About the statement of Licensing conditions of carrying out economic activity on the management of hazardous waste" (Order of the Cabinet of Ministers of Ukraine, 2016) and the Law "On the handling of explosives for industrial purposes" (1994).

There are several general clauses of liability linked to dangerous activities in the Civic Code of Ukraine (CCU) – art. 805 (vehicles), 767 (rent), 1187 (damages reimbursement). Nevertheless, specific legal acts provide a strict liability regime for certain activities.

The determination of what constitutes a dangerous activity is included in Art. 1187 CCU and related to the use, storage, or maintenance of vehicles, machinery, and equipment, use, and storage of chemical, radioactive, explosive, and flammable and other substances, keeping wild animals, service dogs and dogs of fighting breeds, etc. [which] creates an increased danger for the person who carries out this activity and other persons. The national courts also can define this issue, so due to such provisions Ukraine is potentially more flexible when it comes to integrating dangerous activities related to AI systems.

Concerning the third type of liability, there is no specific law on the keeping of potentially dangerous animals. According to the Ukrainian legislation, animals (dogs and cats) are the object of property rights and therefore owners must bear the full burden of responsibility for them (art. 1187 CCU). So, in case of harm to human health or property, owners will bear administrative responsibility according to Art. 154 of the Code of Administrative Offenses. If a dog is the source of increased danger, the right to compensation arises regardless of the fault of its owner. Thus, Ukraine specifically limits strict liability and does not include strict liability provisions for damage caused by different animals.

The final group constitutes vicarious liability. This type of liability covers a diverse set of situations when one person in specific circumstances is liable for an action of another person (Art. 31–39 CCU). The Ukrainian national system includes several grounds for vicarious liability. For example, the liability of an employer for its employee, of a legal person for its member, of a principle for its agent, of a person with contractual obligation for the person under contractual obligation, of a guardian for a non-culpable person (including culpable minors).

The analysis of the Ukrainian national system provides a comprehensive overview of the diversity of approaches to fault-based liability. General clauses in national laws have been considered as providing more flexibility. The national system is based on rather common provisions relating to strict liability.

Applying strict liability principles to AI systems (machine learning or deep learning), by analogy to damage caused by one of the models (injuries by wild animals and vicarious liability), provides a path to distinguish between types of AI systems based on their level of intelligence and danger. In most cases of machine learning it would be reasonable to limit strict liability only to specific types of damage attributable to an animal. If we have to deal with deep neural nets, strict liability could be extended to vicarious liability.

Discussion

A number of very recent publications provided an extensive analysis of possible solutions. Considering the specific aims of this article in terms of possible Ukraine action, only three very broad policy directions are considered. First, the *status quo* scenario, requires no additional action on the national level. The second one is "improvement or amending" current legislation, and the third is the adoption of a "new specific legislation" (Table 2). Those policy solutions are not quantitatively assessed but only briefly qualitatively discussed in Table 2.

In order to address the policy options outlined above using certain criteria, we report here the results of the discussions, which were published in 2019 in the Report on liability for artificial intelligence and other emerging digital technologies (European Commission, 2019).

The report concluded: "While existing rules on liability offer solutions with regard to the risks created by emerging digital technologies, the outcomes may not always seem appropriate, given the failure to achieve: (a) a fair and efficient allocation of loss (...); (b) a coherent and appropriate response of the legal system to threats to the interests of individuals (...); (c) effective access to justice" (European Commission, 2019).

The first scenario foresees that a delay in addressing the outstanding issues and consequences will increasingly generate costs. Therefore, this option is not preferred.

The second policy option is based on the current framework to address the existing challenges. The outcomes of this policy option are medium because it would be unlikely for the revision of the legal system alone (even in the best-case scenario) to be able to address all outstanding challenges. Fair and efficient allocation of loss is medium, but over time it could potentially decrease to low if outstanding challenges remain not addressed.

The second and third policy options are better based on a risk-based approach. There is no need to balance between a mix of fault-based and strict liability provisions because the classification of different situations does not always have a common ground (high risk – strict liability, low risk – a fault-based liability regime). In the case of strict liability for all situations, this generates higher costs for the public system

Table 2

Main criteria for accessing policy options in the field of strict liability in Ukraine

Criteria / Policy option	Enhancing innovations	Fair and efficient allocation of loss	Interests of individuals	Access to justice
1. Status quo	Medium	Low	Low	Low
2. Improvement or revision	Medium	High	Medium	Medium
3. New specific legislation	Medium	High	Medium	High

Source: own research.

and potentially could also negatively impact innovation, but could be more desirable for victims. And *vice versa*, a fault-based liability system could be much more restrictive to victims but facilitate innovations and enhance implementation of risky product. Accordingly, outstanding challenges may impede competition and create obstacles harming the Ukrainian economy.

The third option to adopt specific legislation could potentially be a favorable solution. First of all, a risk-based approach ensures appropriate management of risks that would arise for economic actors and provide a good opportunity for victims to receive compensation. Also, a single legislation act is more easily adopted for new technological innovations: for example, in the case of deep neural nets, the risk-based approach could be extended to vicarious liability.

Conclusions

Revision of the EU's Eastern Partnership country's civil liability regime for artificial intelligence systems could be one of the main challenges for better market access and would likely generate economic and social outcomes. Currently, there are no specific rules on the liability of AI systems in Ukraine. National liability rules indicate how liability claims can be resolved and whether damages resulting from the artificial intelligence system can fall into one of the current national categories of strict or fault-based liability.

Objectively, what is needed is not only the legal framework for the practical use and application of AI technologies, but also the construction of a comprehensive model of legal regulation. That should also include the following: the formation of universal standards and rules for the use of AI property turnover and digital (virtual) technological environment, regulation of methods and forms of application of AI technologies, the use of IP property rights on AI technologies, features of legal regimes of regulation depending on the type of AI technology.

Based on legal analysis, Ukraine's rules are classified as flexible to new situations and cases relating to claims for damages connected with AI systems. Provisions in national law provide either a general clause or a non-exhaustive list of situations that might fall within the scope of strict liability rules and exceptions relating to things, activities, animals or vicarious liability.

The risk management approach as the main tool for the regulation of liability in different policy options has better potential to minimize risks and increase safety, decrease legal uncertainty and facilitate innovations, and ensure consumer rights.

The application of current Ukrainian secondary law on liability to AI would likely occur insufficient and provide an insufficient level of protection, both in relation to the areas already covered by national law and, even more so, in relation to new risks that are not covered by existing law.

Introducing the different types of liability in the framework of policy options suggests discussion not only about political and economic feasibility but also about social justice and public acceptance. It will be important that future research investigates public perception of civil liability regime for artificial intelligence in Eastern partnership countries.

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Od 2017 r. zatrudniony Instytucie Bezpieczeństwa Zarządzania Akademii Pomorskiej w Słupsku na stanowisku profesora. Jego dorobek naukowy obejmuje około 80 publikacji, w tym autorstwo/współautorstwo 14 opracowań zwartych (z czego dwa to monografie, a trzy to podręczniki i inne opracowania dydaktyczne). W ostatnich latach jego główny nurt badań wiąże się z transformacją cyfrową w administracji publicznej w krajach Europy Środkowej i Środkowo-Wschodniej.