Private Liability for AI-Related Harm: Towards More Predictable Rules for the Single Market*

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ABSTRACT: Artificial intelligence (AI) is an integral part of our everyday lives, able to perform a multitude of tasks with little to no human intervention. The number of devices with integrated digital features on the market, including consumer products, is constantly increasing. Many legal issues related to this phenomenon have not been comprehensively addressed, or resolved, yet. Also, the question arises whether the existing legal rules on damages liability can resolve cases involving AI so as to make case outcomes predictable across the Union. EU institutions are in the process of evaluating if and to what extent new legislation regarding AI is needed, envisioning a European approach to avoid fragmentation of the Single Market. This article critically analyses the most relevant preparatory documents and proposals with regard to civil liability for AI issued by EU legislators. Moreover, it is crucial to clarify the applicability of existing EU legislation such as the framework concerning product safety and product liability to new technologies. To achieve a more predictable framework for the future, the legislation applicable to AI must be aligned, and it must be evident which rules are applicable in which situation. The envisioned level playing field throughout the Single Market justifies harmonisation of many aspects of damages liability for AI-related harm. In the process, particular AI characteristics should be carefully considered in terms of questions such as causation, fault, and the burden of proof.

I. Introduction

Finding an all-encompassing definition for Artificial Intelligence (AI) is hardly possible. EU policy documents define AI as systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals. An AI application is trained to carry out its tasks by utilising machine learning and large amounts of data.[1] AI has become an integral part of our everyday lives and is transforming our society.

The applicability of traditional concepts of damages liability law and existing regulatory frameworks to situations where new technologies are involved is not straightforward.[2] In the EU, extra-contractual liability is mainly regulated in national laws. These rules, as well as certain EU law rules, might be insufficient for resolving AI-related cases efficiently, predictably, and fairly.

AI-related harm does not necessarily differ from other harm so much as to directly justify entirely new and comprehensive AI-liability legislation. Yet, there might be a need for additional legislation when complex devices and value chains are involved. The goal of avoiding market fragmentation within the EU may justify even comprehensive EU-level harmonisation of AI-related private liability. This would provide legal certainty to both stakeholders throughout the value chain and injured parties.

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[1] See e.g. Stuart J. Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (Pearson, 2016), 1-28; European Commission, *Artificial Intelligence for Europe* (Communication) COM (2018) 237 final, April 25, 2018, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A 2018%3A237%3AFIN, 1. For the purposes of this article, it is not necessary to define and distinguish AI, intelligent automation and robotics in a detailed manner. More specific terminology is used in our text where necessary. See also e.g. Gerhard Wagner, "Robot liability", in *Liability for Artificial Intelligence and the Internet of Things*, eds. Sebastian Lohsse, Rainer Schulze, and Dirk Staudenmayer (Hart, 2019), 27-28.

[2] See also e.g. European Commission, *Staff Working Document, IMPACT ASSESSMENT Accompanying the document "Proposal for a Regulation of the European Parliament and of the Council on general product safety"*, SWD(2021) 168 final, June 30, 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021SC0168, 11.

In this article, we will provide an overview of preliminary plans and discussion regarding liability for AI-related harm in the EU. Firstly, we will address policy approaches and legislative proposals issued by EU institutions.[3] Secondly, we will look at selected EU law rules already in force relevant to AI-related harm. We will then discuss the applicability of existing doctrines of damages liability to AI, before taking a closer look at the possible way forward in the EU to achieve more predictable rules for the Single Market.

II. Plans for developing EU law

EU institutions have acknowledged the need for legislation concerning AI in diverse documents.[4] No final EU rules addressing general civil liability for AI-related harm have been adopted yet. A legislative proposal on liability for AI-related harm by the European Commission (Commission) is tentatively expected in 2022.[5]

A. Policy approaches

The Commission aims at creating an ecosystem of excellence and trust regarding AI, promoting its uptake but also addressing the risks related to new technologies.[6] EU institutions shall cooperate closely with Member States in key areas such as research, investment, market uptake, skills and talent, data, and international cooperation.[7]

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[3] For discussion see e.g. European Commission, *Report on the safety and liability implications of AI, the Internet of Things and Robotics,* COM (2020) 64 final, February 19, 2020, https://ec.europa. eu/info/publications/commission-report-safety-and-liability-implications-ai-internet-things-and-robotics-0_en, 12 (Hereafter, *Safety and Liability Report*); Sebastian Lohsse, Rainer Schulze, and Dirk Staudenmayer, "Liability for Artificial Intelligence", in *Liability for Artificial Intelligence and the Internet of Things,* eds. Sebastian Lohsse, Rainer Schulze, and Dirk Staudenmayer (Hart, 2019) 19; Wagner, "Robot liability", 33-34; see also more broadly e.g. Walter van Gerven, "Harmonization of private law: Do we need it?", *Common Market Law Review* 41, no. 2 (2004): 505.
[4] See e.g. European Commission, *White Paper on Artificial Intelligence – A European Approach to Excellence and Trust*, COM 2020 65 final, February 19, 2020, https://ec.europa.eu/info/sites/default/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf; Commission, *Safety and Liability Report*, 2020.
[5] See European Commission, *Annexes to the Communication from the Commission Fostering a European Approach to Artificial Intelligence: Coordinated Plan on Artificial Intelligence 2021 Review*, COM (2021) 205 final, April 21, 2021, https://digital-strategy.ec.europa.eu/en/library/coordinated-plan-artificial-intelligence-2021-review, 34.
[6] Commission, *White Paper*, 2020, 3, 5-6.
[7] *Ibidem*, 1, 5.

They acknowledge that AI, the Internet of Things (IoT) and robotics share several properties, such as the ability to combine connectivity, autonomy and data dependency to perform tasks with little to no human intervention. These systems owe their high degree of complexity to the plurality of stakeholders involved in the supply chain and the number of different components.[8] It may be impossible for the injured party to pinpoint the origin of damage to file a successful claim.[9]

One must consider how to amend existing legal frameworks and ensure that future regulation – which should apply to both products and services – is sufficiently flexible to accommodate technological developments.[10] Individuals suffering damage through new technologies should have the same level of protection as victims of traditional technologies.[11]

Obligations and responsibility related to the utilisation of AI should be placed on the actor most able to control a specific risk.[12] In general, the prevailing approach is that there will always be a human in the value chain who can be expected to bear responsibility.[13] The idea of assigning legal personhood to robots or AI systems has been discarded in EU policy papers.[14]

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[8] Commission, *Safety and Liability Report*, 2020, 2.

[9] *Ibidem*, 14; This issue is also pointed out by academics, see e.g. Erdem Büyüksagis, "Responsabilité pour les systèmes d'intelligence artificielle", HAVE/REAS, 1/2021, 17.

[10] Commission, *Safety and Liability Report*, 2020, 10-17.

[11] *Ibidem*, 13, 16-17.

[12] *Ibidem*, 22.

[13] European Parliament, *Civil liability regime for artificial intelligence, European Parliament resolution of 20 October 2020 with recommendations to the Commission on a civil liability regime for artificial intelligence (2020/2014(INL))*, 2021/C 404/05, OJ C 404/107 October 6, 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020IP0276, paragraph 7 (Hereafter, *Civil Liability Resolution*). See also Andrea Bertolini, *Artificial Intelligence and Civil Liability* (Study Requested by the JURI Committee, European Parliament, July 2020). https://www.europarl.europa.eu/RegData/etudes/STUD/2020/621926/IPOL_STU(2020)621926_EN.pdf, 37 (Hereafter, *EP JURI Study*). Additionally, the Commission notes that the behaviour of AI applications is in any event determined by (human) developers programming them. See e.g. Commission, *White Paper*, 2020, 16, 22; see also Bertolini, *EP JURI Study*, 2020, 33.

[14] See e.g. EP, *Civil Liability Resolution*, 2021, paragraph 7. For the discussion see e.g. Bertolini, *EP JURI Study*, 2020, 33-39; Mark Chinen, *Law and Autonomous Machines: The Co-Evolution of Legal Responsibility and Technology* (Edward Elgar, Technology and Society Series, 2019) 194-222; Wagner, "Robot liability", 53-62.

B. Existing and planned EU rules relevant for AI-related harm

The EU currently lacks a harmonised civil liability regime for AI applications. General legislation on product liability[15] and product safety,[16] as well as more specific rules (like those on data protection[17] or medical devices[18]), can be applied.

The Product Liability Directive (PLD) imposes no-fault liability on European producers.[19] The rules have a dual function: to enable those harmed by unsafe products to receive compensation, as well as to deter producers from neglecting the safety of their products by holding them accountable.[20]

Product safety rules aim to prevent unsafe products from entering the market through monitoring and enforcement.[21] The main framework is the General Product Safety Directive (GPSD), the most important piece of consumer safety legislation.[22]

Product safety and product liability rules shall complement each other: liability "catches" issues that are not prevented by safety requirements. However, their effectiveness and ability to sufficiently accommodate new

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[15] 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, [1985] OJ L 210.

[16] See in particular Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on general product safety [2001] OJ L 11 and e.g. Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products OJ L 218; Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, [2006] OJ L 157.

[17] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation), [2016] OJ L 117.

[18] Regulation 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, [2017] OJ L 117.

[19] "Liability of defective products". *European Commission*. https://ec.europa.eu/growth/single-market/goods/free-movement-sectors/liability-defective-products_en.

[20] See e.g. EP, *Civil Liability Resolution*, 2020, lit. A; Commission, *Safety and Liability Report*, 2020, 12. For discussion see also e.g. Helmut Koziol, *Basic Questions of Tort law from a Germanic Perspective* (Jan Sramek Verlag, 2012), 78.

[21] Christian Twigg-Flesner, "Guiding principles for updating the Product Liability Directive for the digital age", *Pilot ELI Innovation Paper, European Law Institute* (January 2021): 4. https://ssrn.com/abstract=3770796.

[22] Geraint Howells, Christian Twigg-Flesner, and Thomas Wilhelmsson, *Rethinking EU Consumer Law* (Routledge, 2017), 258.

technological developments has been questioned.[23] In response, in June 2021, the Commission issued a proposal for a Regulation in General Product Safety (draft GPSR).[24]

The PLD has evident shortcomings in terms of adjudicating cases involving AI-related harm.[25] It was conceptualised for linear, one-directional value chains. Digitalised products depend on the supply of digital content, which is not one-directional and may come from different providers. Component parts can be supplied by different companies.[26]

The Medical Devices Regulation (MDR) is sector-specific legislation containing provisions applicable to software used for medical or clinical purposes. Medical device manufacturers are liable for all claims arising from their product and must be prepared to provide sufficient financial coverage in respect of their potential liability.[27] In practice, this is achieved through adequate liability insurance for covering no-fault liability.[28]

The General Data Protection Regulation (GDPR) applies when processing personal data. AI in data processing is ubiquitous, and a seemingly minor personal data processing task may bring an entire AI system under the scope of the GDPR's liability rules. Article 82 of the GDPR states that any person who has suffered material or non-material damage due to an infringement of the GDPR has the right to compensation from the controller or processor for the damage suffered.

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[23] See e.g. Commission, *Safety and Liability Report*, 2020, 14; EP, *Civil Liability Resolution*, 2020, paragraph 8; Bertolini, *EP JURI Study*, 2020, 47-62.

[24] European Commission, *Proposal for a Regulation of the European Parliament and of the Council on general product safety*, COM (2021) 346 final 2021/0170 (COD), June 30, 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0346.

[25] Detailed discussion in section IV.B below.

[26] Twigg-Flesner, "Guiding principles for updating the PLD", 6; Tiago Sérgio Cabral, "Liability and artificial intelligence in the EU: Assessing the adequacy of the current product liability directive", *Maastricht Journal of Comparative Law* 27, no. 5 (2020): 617.

[27] The new requirements concerning financial safeguards originate, in part, from a "breast implant scandal". See e.g. "Medical devices: European Commission calls for immediate actions – tighten controls, increase surveillance, restore confidence". *European Commission*. (Press release February 9, 2012) https://ec.europa.eu/commission/presscorner/detail/el/IP_12_119; Victoria Martindale and Andre Menache, "The PIP scandal: An analysis of the process of quality control that failed to safeguard women from the health risks" *Journal of the Royal Society of Medicine* 106, no. 5 (2013): 173-177; Judgment of 11 June 2020, *RB v. TÜV Rheinland LGA Products & Allianz IARD*, Case C-581/18, EU:C:2020:453.

[28] See also e.g. European Commission, *Implementation Model for Medical Devices Regulation – Step by Step Guide*, November 20, 2018, https://ec.europa.eu/docsroom/documents/33661, part 4.

Its rules are not exhaustive and are complemented by Member States laws, particularly regarding compensation for non-material harm, and requirements of causation.[29] Therefore, diverging case outcomes are possible. GDPR liability rules and possible future rules on AI liability face similar challenges, pre-eminently the information asymmetry between the potential claimant and the defendant.[30]

Central drafts in terms of AI-related harm are the "Proposal for a Regulation laying down harmonised rules on AI", adopted by the Commission in April 2021[31], and the Civil Liability Resolution. The latter focuses on the liability of AI-system operators. Both proposals feature a risk-based approach. With regard to the Draft AIA, this means that AI systems classified as high-risk must fulfil a number of requirements in order to be placed on the market. The Civil Liability Resolution suggests a strict liability regime for operators of high-risk AI systems, while operators of other systems are subject to fault liability.

In addition, also the planned Digital Services Act (DSA)[32] will likely be relevant in terms of AI-related harm. It aims at modernising the legal framework surrounding digital services by replacing rules now contained in the E-Commerce Directive (ECD),[33] maintaining the general framework on the responsibilities of providers of intermediary services.[34] The proposal features rules framing the responsibilities of digital service providers to ensure effective supervision and enforcement, as well as ex ante rules to make sure that "gatekeeper platforms" behave

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[29] See GDPR, Article 82, Art 79(2), and Rec. 146.

[30] See GDPR, Recs. 39, 58, and Article 12.

[31] European Commission, *Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act)*, COM (2021) 206 final 2021/0106 (COD), April 21, 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206 (Hereafter, Draft AIA).

[32] European Commission, *Proposal for a Regulation of the European Parliament and of the Council on a Single Market For Digital Services (Digital Services Act)*, COM/2020/825 final 2020/0361 (COD), December 15, 2020, https://eur-lex.europa.eu/legal-content/en/TXT/?uri=COM%3A2020%3A825%3AFIN (Hereafter, Digital Services Act Proposal).

[33] Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market, [2000] OJ L 178.

[34] Commission, *Digital Services Act Proposal*, 2020, 3.

fairly, to promote competition.[35] Trilogue negotiations are ongoing at the time of writing.[36]

III. Applicability of existing liability concepts to AI-related harm

Discussion is ongoing regarding the applicability of existing legal doctrines to AI-related harm. The main approach appears to be that actions by autonomous machines can be attributed to individuals or groups of humans in the value chain.[37] However, attribution will be more difficult the more autonomous the systems become, as with machine-learning techniques AI-driven devices can function without humans playing any role in decision-making.[38] The core elements of damages liability considerations such as the obligation to live up to the standard of care may seem void.[39]

A. Who is liable?

In complex value chains involving multiple stakeholders, a central question is: who incurs liability and under what circumstances? The fault-based tort law rules of EU Member States typically provide for the liability of the users of an AI system, but also for that of other parties of the value chain, such as owners, operators, programmers, manufacturers, experts or even sellers, if their faulty act or omission caused the AI-related harm.[40] Under a risk-management approach, the liable party would always be the one

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[35] "The Digital Services Act package". *European Commission*. https://ec.europa.eu/digital-single-market/en/digital-services-act-package.

[36] "Digital Services Act (DSA)". *European Parliament*. (Press Release February 15, 2022) https://www.europarl.europa.eu/committees/en/digital-services-act-dsa-/product-details/20220207CAN64924.

[37] E.g. Mark Chinen, "The co-evolution of autonomous machines and legal responsibility", *Virginia Journal of Law & Technology* 20 (2016): 339, 342; EP, *Civil Liability Resolution*, 2020, paragraph 7. See also Bertolini, *EP JURI Study*, 2020, 37. Additionally, the Commission notes that the behaviour of AI applications is determined by (human) developers programming them. See e.g. Commission, *White Paper*, 2020, 16, 22. See also Bertolini, *EP JURI Study*, 2020, 33.

[38] See also e.g. Woodrow Barfield, "Liability for autonomous and artificially intelligent robots", *Paladyn, Journal of Behavioral Robotics* 9 (2018): 193.

[39] See e.g. Yavar Bathaee, "The Artificial Intelligence black box and the failure of intent and causation", *Harvard Journal of Law & Technology* 31, no. 2 (2018): 889, 891; Chinen, "Co-evolution of autonomous machines", 343.

[40] See e.g. Nico Bilski and Thomas Schmid, "Verantwortungsfindung beim Einsatz maschinell lernender Systeme", NJOZ, (2019): 660; Michael Denga, "Deliktische Haftung für künstliche Intelligenz", *Computer und Recht* 34, no. 2 (2018): 71.

best suited to minimise risks.[41] The opaqueness and unpredictability of AI applications, as well as the rapidly evolving technological reality, might make it difficult to identify this party.

Users may be held liable for negligent behaviour under general law on damages liability, for instance if they neglect safety measures or use devices like robots without reading the user manuals.[42] They may also be held liable when the cause of damage is software they installed after purchasing the product, or for modifications they made to the original software.[43]

In this regard, the obligations of consumer-users and professionals may differ. Consumers often have limited technical knowledge and are more likely to just rely on the safety of a device.[44] However, that does not make them exempt from basic safety obligations.

One can argue that professionals are liable because they should only use tools they can consider themselves responsible for. Here, the inability to foresee the behaviour of AI might undermine that justification.

B. Causation

Law on damages liability operates with the notion of causation, which consists of factual causation and legal causation.[45] For factual causation, one can refer to the *conditio sine qua non* test, also called the "but for" test: any condition without which damage would not have occurred is relevant.[46] Technically, this also includes causes that are irrelevant, or even absurd, in relation to a concrete case.[47] Legal causation is used to limit the relevant causes in comparison to the "but for" test. Here, divergences can exist between EU Member States. While some apply solely this test, others may

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[41] See also e.g. Omri Rachum-Twaig, "Whose robot is it anyway? Liability for Artificial Intelligence-based robots" *University of Illinois Law Review* 2020, forthcoming (2019): 16-20, 24-27, 39-40. https://ssrn.com/abstract=3339230; Caroline Cauffman, "Robo-liability: The European Union in search of the best way to deal with liability for damage caused by Artificial Intelligence", *Maastricht Journal of European and Comparative Law* 25, (2018): 527, 528.

[42] E.g. Gerald Spindler, "User liability and strict liability in the Internet of Things and for robots", in *Liability for Artificial Intelligence and the Internet of Things*, eds. Sebastian Lohsse, Rainer Schulze, and Dirk Staudenmayer (Hart, 2019), 132.

[43] E.g. Wagner, "Robot liability", 50.

[44] See also e.g. Cauffman, "Robo-liability", 530.

[45] See e.g. Jaap Spier and Olav A Haazen, "Comparative conclusions on causation", in *Unification of Tort Law: Causation*, ed. Jaap Spier (Kluwer Law International, 2000) 127, 130.

[46] See e.g. Cees van Dam, *European Tort Law* (Oxford University Press, 2013), 121-122.

[47] Herbert Lionel Adolphus Hart and Tony Honoré, *Causation in Law* (Clarendon Press, 1985), 115.

use the theory of adequate causation, or an open and flexible approach.[48] In adequate causation, harm must be a direct and reasonably foreseeable outcome of behaviour. Member States applying a flexible approach include policy considerations or other flexible criteria to determine which causes and instances of damage are connected to each other in a legally relevant manner.[49]

The traditional legal concept of causation assumes that one already knows who the wrongdoer is. Legal rules are generally human-centred, incomparable to the behaviour of AI systems.[50] Especially in the case of complex AI systems, the actual cause or source of harm may not be directly evident. In addition, a harmful "action" by an AI system is not a human conduct. In this case, is it enough when the human programming or using the system provides the opportunity for the harm to occur?[51]

Several policy papers by EU institutions mention that it may be difficult to prove the chain of causation, which might discourage individuals from filing a claim.[52] However, new technologies also offer opportunities to record and to monitor the system in operation, which might, to some extent, lessen the difficulty.[53]

In the adequacy test, the question is what exactly must be foreseeable, by whom, and when.[54] If foreseeability to humans is necessary to establish causation, it is crucial to understand the decision-making process of an AI system.[55] AI-driven systems' decision-making processes do not face the same cognitive limitations as the human brain; their computational capacity allows them to search through an uncountable number of possible solutions in a short time.[56] As these systems can learn and change their patterns and adapt to new conditions, it becomes ever harder to attribute their actions to producers or operators.[57] Consequently, human actors may

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[48] See e.g. Spier and Haazen, "Comparative conclusions", 127, 130.

[49] *Ibidem*, 133, 134.

[50] E.g. Bathaee, "Artificial Intelligence black-box", 891.

[51] Hart and Honoré, *Causation in Law*, 133.

[52] See e.g. Commission, *Safety and Liability Report*, 2020, 14; Bertolini, *EP JURI Study*, 2020, 56.

[53] See for discussion e.g. Wagner, "Robot liability", 46; the EP JURI Study suggests a "logging by design" requirement: Bertolini, *EP JURI Study*, 2020, 83.

[54] E.g. Miquel Martín Casals, "Causation and scope of liability in the Internet of Things (IoT)", in *Liability for Artificial Intelligence and the Internet of Things*, eds. Sebastian Lohsse, Rainer Schulze, and Dirk Staudenmayer (Hart, 2019), 221.

[55] Bathaee, "Artificial Intelligence black-box", 892.

[56] E.g. Martín Casals, "Causation and Scope of Liability", 222.

[57] See also e.g. Spindler, "User liability and strict liability", 126-127.

try to argue that AI-related harm was genuinely unforeseeable to them. Nonetheless, it is generally known that AI can make individual decisions that are not foreseeable to humans. This is the purpose and the added value of these systems.[58] The unpredictability of AI can itself be deemed foreseeable. Harm caused by AI could therefore be considered recoverable without requiring foreseeability of a particular harm, especially if the type and nature of harm are such that it cannot be considered highly extraordinary in the relevant situation.

While causation is also recognised as a liability requirement in EU tort law, existing rules do not provide for any definition or information. The establishment of causation is left to national courts. EU courts normally apply the "but for" test for factual causation and state that only sufficiently direct consequences of a misconduct are relevant and too remote damage is not recoverable.[59]

C. Fault

Fault consists of two sub-categories: intention and negligence.[60] A person is at fault if they commit an act or omission they should not have committed and are morally accountable for the consequences. To establish negligence, courts tend to apply the average reasonable person or a similar notion as a reference standard.[61] An objective standard of fault is generally applied in EU tort law.[62] In the end, national lawmakers and courts determine what amounts to fault.[63]

In cases involving AI, fault is easy to establish when the cause of damage is an (intentional) intervention of a third party such as a cyber-attack.[64] It

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[58] Denga, "Deliktische Haftung", 72.

[59] Isabelle C. Durant, "Causation", in *Tort Law of the European Community*, eds. Helmut Koziol and Reiner Schulze (Springer, 2008), 51, 56. The idea of direct consequence is already present in older case law discussing causation: Judgment of 13 July 1961, *Meroni and Co and others v. High Authority of the European Coal and Steel Community*, Cases 14, 16, 17, 20, 24, 26 and 27/60 and 1/61, EU:C:1961:16, paragraph 170; See also Judgment of 4 October 1979, *Dumortier frères SA and others v. Council of the European Communities*, Cases 64 and 113/76, 167 and 239/78, 27, 28 and 45/79, EU:C:1979:223, paragraph 21.

[60] See e.g. European Group on Tort Law, *Principles of European Tort Law: Text and Commentary* (Springer, 2005), 66.

[61] See also van Dam, *European Tort Law*, 225-278.

[62] Meinhard Lukas, "Fault liability", in *Tort Law of the European Community*, eds. Helmut Koziol and Reiner Schulze (Springer, 2008), 84, 87, 93.

[63] *Ibidem*, 83.

[64] See also EP, *Civil Liability Resolution*, 2020, paragraph 9.

is more difficult where no clear intervening human-wrongdoer is identifiable. This becomes even more complicated when it is impossible to foresee some of the accidents caused by AI, as the notion of fault can be understood as referring to a failure to prevent foreseeable harm.

To apply traditional fault-based liability rules, one must be able to trace harm back to human behaviour.[65] However, the opacity of certain AI applications can make it even impossible for their programmers to understand how their decision-making process works or what exactly led the AI system to make a specific decision. To close this so-called responsibility gap, there are discussions as to whether at least certain AI systems such as robots should either be classified as agents or be attributed some form of legal personhood. The latter would mean that robots themselves could be liable and obliged to pay compensation out of funds they own. Attributing legal personhood would require extensive legislation and raise legal and practical questions.[66] For instance, the anthropocentricity of legal rules means that attributing legal personhood does not entirely solve the fault problem, as also robots would need to observe due care – unless one would apply a completely objective standard of fault or eventually no-fault liability. In any event, the EP does not see any necessity to provide AI systems with any form of legal personality.[67]

In our view, treating AI systems as agents does not solve the question of how to attribute fault satisfactorily either. In any case, the principal must supervise how agents work, which becomes ever harder the more autonomous an AI system becomes. In this regard, and also when discussing human oversight under the draft AIA, the question is how much control or oversight the principal must have. Is it enough to decide if, when and how to use an AI system? Particularly when more than one person can influence the system, the attribution of fault does not get any easier.[68] The

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[65] See also Commission, *Safety and Liability Report*, 2020, 13.

[66] See also e.g. Béatrice Schütte, Lotta Majewski, and Katri Havu, "Damages liability for harm caused by Artificial Intelligence – EU law in flux", *Helsinki Legal Studies Research Paper No. 69* (2021), https://ssrn.com/abstract=3897839, 15; Chinen, *Law and Autonomous Machines*, 194-222; Bertolini, *EP JURI Study*, 2020, 33-39.

[67] EP, *Civil Liability Resolution*, 2020, paragraph 7.

[68] See also e.g. Paul Opitz, "Civil liability and autonomous robotic machines: Approaches in the EU and US", *Stanford-Vienna TTLF Working Paper* No. 43 (2019), https://www-cdn.law.stanford.edu/wp-content/uploads/2019/02/opitz_wp43.pdf, 20.

Commission proposes to establish clear cybersecurity obligations in future legislation, which would make it easier to determine faulty behaviour.[69]

One could even more broadly consider technical standards to determine negligence.[70] Failure to comply with an applicable standard would then constitute fault. Commentators suggest a reasonable producer or developer in the same situation as a benchmark for cases of negligent harmful programming or similar actions. Moreover, if persons other than the developer or producer influence a system's self-learning, they could also be liable.[71] A further option is to not take foreseeability into account, but to consider only the social and practical outcomes.[72]

IV. The way forward in the Single Market

In this section, we will look more closely at selected aspects of future liability for AI-related harm, such as the risk-based approach, product liability, and the planned operator liability.

A. Risk-based approach

At the core of the EU institutions' policy approaches and legal proposals is the so-called risk-based approach, meaning that they distinguish between high-risk and low-risk AI systems.[73] The risk classification determines certain obligations and procedures, and whether strict liability or fault liability will apply.[74]

In the White Paper and the Civil Liability Resolution, the Commission and the EP use criteria relating to the use of an AI system. It should be classified as high-risk when used in a risk-prone sector and in a risk-prone manner. This is the case when there is an imminent risk of injury, death or significant other harm, or the rights of an individual or a company are significantly affected. Certain AI applications could be considered high-risk due to their intended use alone, for instance in the recruitment of employees or remote biometric identification.[75]

In the Civil Liability Resolution, the EP defined high-risk systems as systems whose autonomous operation involves "significant potential to cause

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[69] See Commission, *Safety and Liability Report*, 2020, 15.

[70] Spindler, "User liability and strict liability", 130.

[71] E.g. Cauffman, "Robo-Liab,ility", 529-530.

[72] See also e.g. Schütte, Majewski, and Havu, "Damages Liabil,ity", 18.

[73] EP, *Civil Liability Resolution*, 2020 paragraph 14.

[74] EP, *Civil Liability Resolution*, 2020, paragraphs 14-22; Draft AIA, Chapter 3.

[75] Commission, *White Paper*, 2020, 18.

harm to one or more persons, in a manner that is random and goes beyond what can reasonably be expected".[76] In this regard, one must consider four factors: the sector in which the system is used, the activities undertaken, the severity of the possible harm, and the probability of the risk materialising.[77] The definition utilises the criteria provided in the White Paper.[78] The EP also proposes an annex containing an exhaustive list of high-risk AI systems and the sectors where they are used. Such a list can provide producers and operators with legal certainty, while preventing diverging interpretations by Member State courts.

In this context, it should be noted that the EP presents a different definition of high-risk in its Resolution for a Framework on the ethical aspects of AI.[79] AI applications are high-risk "when their development, deployment and use entail a significant risk of causing injury or harm to individuals or society, in breach of fundamental rights and safety rules as laid down in Union law".[80] While expressions such as "random" or "beyond what can reasonably be expected" are broad and will need to be interpreted by courts on a case-by-case basis, the reference to a breach of fundamental rights and safety rules appears to be the other extreme, an extremely tight frame.[81]

Presenting different definitions of the same term is counterproductive to the goal of avoiding fragmentation by enabling divergent interpretations by national courts. The Commission previously underlined the need for clarity in defining this central notion, stating that "the determination of what is a high-risk application should be clear and easily understandable and applicable for all parties concerned".[82] As final liability rules have not been enacted, future solutions in terms of liability and high-risk AI remain open.

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[76] EP, *Civil Liability Resolution*, 2020, Draft Regulation, Article 3 (c).

[77] EP, *Civil Liability Resolution*, 2020, paragraph 15.

[78] Commission, *White Paper*, 2020, 17.

[79] European Parliament, *Resolution of 20 October 2020 with recommendations to the Commission on a framework of ethical aspects of artificial intelligence, robotics and related technologies 2020/2012 (INL)*, 2021/C 404/04, OJ C 404/63 October 20, 2020, https://www.europarl.europa.eu/doceo/document/TA-9-2020-0275_EN.html.

[80] *Ibidem*, paragraph 14, Recital 11 of the proposed regulation on ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies.

[81] See also e.g. Schütte, Majewski, and Havu, "Damages Liability", 27.

[82] Commission, *White Paper*, 2020, 17; Commission, *Draft AIA*, 2021, Article 6 and Annex III.

In the Draft AIA, the Commission diverges from solely open criteria to define high-risk items, and instead suggests an additional exhaustive list of high-risk AI systems.[83] Future legislation shall cover the entire life cycle of an AI system and therefore a monitoring scheme for high-risk AI systems is proposed.[84]

The proposal for tighter liability rules for particularly risky AI applications mirrors policy goals of safely introducing AI applications to the markets and gaining the acceptance of the general public for beneficial AI innovations.[85] Tighter liability rules could lead to an increased perception of safety.

The question is whether the proposed exhaustive list of high-risk AI systems would jeopardise the intention of creating future-proof legislation. Although such a list should be reviewed at least every six months, periods of insecurity in terms of risk assessment can hardly be avoided. Additionally, it would make a general definition superfluous and eliminate any flexibility. The idea of using both a very general notion of high-risk systems and simultaneously an exhaustive list would appear ill-advised for goals of both flexibility and legal certainty.

One may also ask whether it is appropriate to use the distinction between high-risk and low-risk, as the only decisive criterion between strict liability and fault-based liability. Not only high-risk systems can cause harm. A person suffering severe harm from a low-risk AI system might be at an unfair disadvantage in obtaining compensation. The Commission correctly notes that identification of high-risk AI can play a central role in making sure that regulatory intervention is proportionate.[86] Yet, it should be borne in mind that the distinction between high-risk and low-risk AI applications should not mean that harm caused by low-risk AI remains a significant problem from the standpoint of individuals' possibilities to obtain compensation.

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[83] Commission, *Draft AIA*, 2021, Explanatory Memorandum, 13; Title III of the Commission draft legislation concerning the utilization of AI; Commission, *Draft AIA*, 2021, Article 6 and Annex III to the Commission draft legislation concerning the utilization of AI.

[84] See Commission, *Draft AIA*, 2021, Articles 61, 62.

[85] See also e.g. "Parliament leads the way on first set of EU rules for artificial intelligence". *European Parliament*. (Press release October 20, 2020) https://www.europarl.europa.eu/news/en/press-room/20201016IPR89544/parliament-leads-the-way-on-first-set-of-eu-rules-for-artificial-intelligence; Commission, *White Paper*, 2020, 9-10.

[86] Commission, *White Paper*, 2020, 17-18.

B. Product liability – Fit for purpose?

Discussion on whether the PLD is fit for the digital age relates to all the requirements of product liability. Policy papers and legal proposals show that the EU legislators are willing to revise the EU product liability framework.[87] Several remarks can be made about the shortcomings of the current PLD and as regards themes to be considered while revising product liability rules. In this section, we will focus on the most important notions of product, producer, defect, and damage.

1. The notion of product

As per Article 2 of the PLD, the term *product* refers to all movables, including electricity. The scope is broad, covering agricultural products, as well as complex industry products. The broad notion of a product should enable future-proof legislation.[88] AI applications are products under the PLD if they are movable items or incorporated in movable items. Classification as a product is more difficult in relation to software, particularly when supplied as stand-alone software. The question here is whether the notion of product is limited to tangibles or includes intangibles as well.

The fact that electricity is explicitly mentioned in the PLD as the only intangible is often used as an argument to exclude other non-tangible items.[89] The lack of clarity in terms of whether software is to be classified as a product has also been criticised in EU policy documents.[90]

The definition of a product in article 3 (1) of the draft GPSR explicitly includes interconnected items. Yet, the proposal fails to clarify whether items must be tangible or may also be intangible. The term non-embedded items as used in recital 19 likely means that also intangibles are included; however, it is not clear.

The Commission proposes to clarify the definition of a product further to consider the complexity of emerging technologies and to ensure that damage caused by products that are defective due to digital features can

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[87] See sections II–III above.

[88] European Commission, *Evaluation of Council Directive 85/374/EEC on the approximation of laws, regulations and administrative provisions of the Member States concerning liability for defective products* (Working document) SWD(2018) 157 final, 5 July, 2018, 23.

[89] Daily Wuyts, "The Product Liability Directive – More than two decades of defective products in Europe" *Journal of European Tort Law* 5, (2014): 4-5.

[90] See e.g. Bertolini, *EP JURI Study*, 2020, 57.

be compensated.[91] They also state that software stored on devices such as DVDs or flash drives should be a product.[92] Nowadays, software is often downloaded, thus an intangible good and not in the purview of the Directive. It has been argued, however, that one could consider the physical manifestation of a program on the host mainframe as a product, supplied when a copy is transmitted over the Internet.[93]

Treating software differently based solely on its medium of distribution or storage seems not justified. One could also solve this by adopting a very broad notion of movable, meaning anything that is not real estate or a service. All movables would constitute products.[94] To draw the line between algorithms that can be classified as products and those that are not products, it has also been suggested to consider whether they replace human discretion. If they do, as is the case for medical diagnosis software, they should not be classified as products.[95]

Currently, the question also arises as to whether software is classified as a product or a service. While essential software components are more likely to be considered integral parts of a product, this may be different for stand-alone applications.[96] Broadening the notion of movable might not help if software could still be classified as a service. Another option is to interpret the existing PLD provision on products as not excluding non-tangible items (although this might be slightly far-fetched).[97] One could draw the line between products and services by deciding that customised programmes produced for an individual or a limited group of persons are services, while broadly available mass-produced programmes are products.[98] The current GPSD includes products made available to the consumer in the context of a service provision for use by them under its scope, provided they do not remain under the control of the service provider.[99]

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[91] European Commission, *Evaluation of Council Directive 85/374/EEC*, 23-24; Commission, *Safety and Liability Report*, 2020, 13.

[92] Commission, *Safety and Liability Report*, 2020, 14.

[93] Wuyts, "The Product Liability Directive", 6.

[94] See also Wagner, "Robot liability", 42.

[95] E.g. Karni A. Chagal-Feferkorn, "Am I an algorithm or a product? When products liability should apply to algorithmic decision makers", *Stanford Law & Policy Review* 30 (2019), 82, 88.

[96] See also Commission, *Safety and Liability Report*, 2020, 14.

[97] See e.g. Bernhard A Koch, "Product liability 2.0 – Mere update or new version?" in *Liability for Artificial Intelligence and the Internet of Things*, eds. Sebastian Lohsse, Rainer Schulze, and Dirk Staudenmayer (Hart, 2019), 105, 106; Wagner, "Robot liability", 42.

[98] See also e.g. Chagal-Feferkorn, "Am I an algorithm or a product?", 84.

[99] Howells, Twigg-Flesner, and Wilhelmsson, *Rethinking EU Consumer Law*, 267.

In the case of custom-made AI solutions sold as a *service*, the current PLD is not applicable. As contractual liability and general extra-contractual liability rules provide remedies, services could possibly remain excluded from the scope of EU product liability legislation. However, one must carefully consider whether the other remedies are sufficient, and whether general liability rules should be modified by new EU law to also include custom-made AI solutions sold as a service.

Both academics and EU institutions recognise that product liability rules could be applied to software and that applicability to software is desirable in the future. For the sake of legal certainty, applicability to software should be set out clearly in future rules.

2. The producer

Article 3 of the PLD defines the producer primarily as "the manufacturer of a finished product, the producer of any raw material or the manufacturer of a component part and any person who, by putting his name, trademark, or other distinguishing feature on the product presents himself as its producer". If the actual producer cannot be identified, both the importer and any supplier can be classified as the producer. The broad concept of the term shall provide the injured party with an accessible defendant.[100] The producer is usually the party who is best suited to mitigate or eliminate risks related to their products.[101]

In a complex value chain, it can be challenging to identify a correct producer. For example, the party providing data or training an AI application may have alone committed an error, which caused an accident. Extra-contractual damages liability is in principle possible in such situations,[102] but claims may be unsuccessful.[103] Especially if the person harmed is an end-user or an outsider, it would be difficult for them to prove that the cause of the damage was in fact the data used to train the AI application. As information asymmetry often exists between the harm-sufferer and the potential defendants, the former might be unable to point out the precise actor in the value chain that caused the damage. Also in this regard,

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[100] Twigg-Flesner, "Guiding principles for updating the PLD", 3.

[101] E.g. Chagal-Feferkorn, "Am I an algorithm or a product?", 79.

[102] See also e.g. Peggy Valcke, Aleksandra Kuczerawy, and Pieter-Jan Ombelet, "Supervising automated journalists in the newsroom: Liability for algorithmically produced news stories", *Revue de Droit des Technologies de l'Information* 61, (2016): 5, 9-12, 15-17.

[103] See also e.g. Commission, *Safety and Liability Report*, 2020, 14.

the broad understanding of who is a producer should prevent a defendant from pointing at another person responsible, which might force the plaintiff to undertake complex investigations as to who is the correct defendant. In any case, there should always be a right of recourse against the actually responsible person.[104]

3. Defectiveness

Article 6 (1) of the PLD establishes that "a product is *defective* when it does not provide the safety which a person is entitled to expect, taking all circumstances into account". The presentation of a product and its reasonably expected use – which includes foreseeable misuse – are relevant here.[105] This can be problematic when a case concerns algorithms or software.

A software program that has incorrect code lines or is exceptionally vulnerable to cyber-attacks does not provide the safety that a user is entitled to expect and is therefore defective. The same applies when insufficient information or warnings are provided. However, design defects and warning defects are not always obvious.[106] Harm can also occur because the conditions (environment) surrounding the AI application changed and the application did not adapt its actions to this change. Here, the question is whether the producer should have taken the variation of the surrounding conditions into account. If so, the product was defective already when put into circulation.

Common indicators to establish a defect in traditional products include malfunction, violation of safety standards, balancing risks and benefits of a product, or comparing with similar products. In the case of AI applications, the suspected defect can be that an algorithm has been defectively designed, which leads to the question how this can be verified. Traditionally, a starting point is *res ipsa loquitur*: a product that is malfunctioning while being used reasonably and correctly is probably defective. Even so, this test is inefficient if the malfunction is not obvious.[107] It has also been suggested to classify products as defective in the sense of the PLD when they are deemed unsafe under the scope of the GPSD.[108]

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[104] Twigg-Flesner, "Guiding principles for updating the PLD", 6.

[105] Bertolini, *EP JURI Study*, 2020, 57; Commission, *Safety and Liability Report*, 2020, 6.

[106] See also Jean-Sébastien Borghetti, "How can Artificial Intelligence be defective?", in *Liability for Artificial Intelligence and the Internet of Things,* eds. Sebastian Lohsse, Rainer Schulze, and Dirk Staudenmayer (Hart, 2019), 66.

[107] *Ibidem*, 67.

[108] Howells, Twigg-Flesner, and Wilhelmsson, *Rethinking EU Consumer Law*, 274.

Another option to determine defectiveness would be (at least in theory) to compare the outcomes of two or more algorithms applied to solve the same problem. This approach would require the existence of a comparable algorithm, which would limit its use when applied to novel or niche technologies.[109]

One could also establish harmonised technical standards. Deviation from these would indicate defectiveness.[110] It seems hardly feasible to develop harmonised standards for algorithms as these are usually tailored to different types of products, and different manufacturers might program algorithms in different ways. These reasons make it difficult to draft any kinds of common and generally applicable rules. Strict technical standards could also deter innovation. However, one must take into account that certain algorithms can even cause harm without being defective. The decision of an algorithm that has a certain percentage of accuracy might cause harm to a person who is on the "wrong" side of the statistics, yet it functions the way it is expected to.[111] As a consequence, such algorithms cannot be considered products in the first place.

Another issue is that under the current PLD, a product must be defective when put into circulation, meaning that the focus is on the moment the product is placed on the market.[112] This is based on the assumption of a one-time supply to the customer.[113] Thus, defects caused by maintenance or updates are not covered by the Directive. AI systems may be updated multiple times and undergo significant changes during their life cycle. Many depend on internet connectivity for proper functioning, which creates additional system risks. Moreover, the user can – knowingly or not – contribute to increasing risks by making mistakes while installing or utilising software, refusing or forgetting to install necessary security updates or, for instance, by choosing unsafe passwords.[114] Fortunately, the Commission recognises that modifications to functions of AI systems during their life cycle due to software updates or machine learning should be addressed

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[109] See also e.g. Schütte, Majewski, and Havu, "Damages liability", 22.

[110] See Cristina Amato, "Product Liability and Product Security: Present and Future", in *Liability for Artificial Intelligence and the Internet of Things,* eds. Sebastian Lohsse, Rainer Schulze, and Dirk Staudenmayer (Hart, 2019), 93-94.

[111] Chagal-Feferkorn, "Am I an algorithm or a product?", 85.

[112] See also Wuyts, "The Product Liability Directive", 21.

[113] Twigg-Flesner, "Guiding principles for updating the PLD", 8.

[114] See also e.g. Spindler, "User liability and strict liability", 128.

in future legislation.[115] A first step in this direction has been taken with the Draft AIA. With the rules on post market monitoring included in the Draft AIA, the Commission takes a holistic approach aiming to cover the entire life cycle of an AI system.[116] To avoid future fragmentation, it will be crucial to align AI legislation and product liability, as well as product safety legislation in this regard.

4. Damage

Pursuant to Article 9 of the PLD, *damage* refers to harm caused by death or personal injury, as well as harm to property items other than the defective product itself, provided that they were meant for private use or consumption and actually used or consumed privately. Pure economic loss and non-material harm are not covered by the Directive. However, these types of harm may occur when AI systems are used. Harm-suffers must rely on national laws to recover losses not covered by the PLD (if no other particular EU liability rules apply). Under the scope of the PLD, the injured party can recover damages caused by death or personal injury, as well as damage to property used for private purposes other than the defective product itself, above a threshold of € 500.[117]

In terms of items harmed, whether damage to data falls within the scope of the PLD or "items of property" only covers tangibles is currently ambiguous.[118] This is also critically discussed in the EP JURI Study in relation to the fact that privacy and cybersecurity issues are not addressed at all in the PLD.[119] Currently, it appears to be up to the Member States to decide whether data qualifies as property or not.[120] Additionally, the fact that Member States may currently apply additional national rules for compensating non-material harm[121] is likely to lead to different case outcomes across the EU.[122]

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[115] Commission, *White Paper*, 2020, 14.

[116] Commission, *Draft AIA*, 2021, Rec. 72, Articles 53-55.

[117] See Art. 9 PLD.

[118] See e.g. Koch, "Product liability 2.0", 103.

[119] Bertolini, *EP JURI Study*, 2020, 59.

[120] See PLD, Article 9; and e.g. Bertolini, *EP JURI Study*, 2020, 59.

[121] See PLD, Rec. 9 and Article 9.

[122] For further discussion on recoverable harm, see section V. D below.

5. Defences

Pursuant to article 7 of the PLD, producers are not liable when they prove that (a) they did not put the product into circulation, (b) considering all relevant circumstances, the defect did not exist when the product was put into circulation or only appeared afterwards, (c) they did not manufacture the product for sale or any other form of distribution or they did not manufacture or distribute it in the course of their business, (d) the product was defective due to compliance with mandatory regulations, (e) the state of scientific and technical knowledge at the time when they put the product into circulation was not such as to enable the existence of the defect to be discovered (development risk defence), or (f) where it concerns the manufacturer of a component part, the defect is attributable to the design of the product into which the component part is implemented. For the purpose of this contribution, we will focus on article 7 (b), the development risk defence set out in article 7 (e), as well as article 7 (f), as in our view these three defences can be particularly challenging when AI is involved. In terms of article 7 (b), one must consider that it is common for AI systems to change throughout their life-cycle, either by means of updates, installation of other programs, or for instance by changes occurring in the course of machine learning processes. If the original producer also provides updates and similar features inducing changes to the system, they stay involved. With regard to traditional products, 'putting into circulation' means a clear cut in a way that the producer can no longer influence the product.[123] If updates provided by the producer lead to a defect, it could jeopardise one of the PLD's goals, namely consumer protection, if they could escape liability by stating that the damage came into being only after the system was placed on the market.

As regards the development risk defence, the benchmark of available scientific and technical knowledge is an objective one.[124] In certain Member States, stricter rules concerning this matter have been adopted, as allowed by the Directive. Also, the implementation of the exemption itself has been divergent.[125] The availability of this defence is not uniform across the

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[123] See also e.g. Twigg-Flesner, "Guiding principles for updating the PLD", 10.

[124] Duncan Fairgrieve, et al., "Product Liability Directive", in *European Product Liability: An Analysis of the State of the Art in the Era of New Technologies*", ed. Piotr Machnikowski (Intersentia 2016), 62.

[125] See the preamble of the PLD; Judgment of 29 May 1997, *Commission v. United Kingdom*, Case C-300/95, EU:C:1997:255; and for discussion e.g. Marcus J. Pilgerstorfer, *European Product*

Union. When revising the product liability rules, it should be considered whether an exemption such as this – potentially highly relevant in the context of rapidly developing technologies – is desirable, and whether this question should in any event be fully harmonised.

Finally, also the defence enshrined in article 7 (f) of the PLD can prove problematic regarding products with AI components. The first question to raise in this context is whether digital elements are component parts under the scope of the provision. If digital features are essential for the functioning of the final product, or even its main feature, they might be more than just a component.[126] In this regard, it could be necessary to clearly distinguish between hardware, software, data and programs.

C. Operator liability

The focal point of the EP Draft Regulation on Civil Liability for AI[127] is the liability of the operator. Article 4 provides for their strict liability for damage resulting from the use of high-risk AI, while article 8 establishes fault-based liability when low-risk AI is involved.[128] The operator as the liable person is a sensible choice, as harm-sufferers can usually identify them easily. In addition, the operator is often the person best suited to take accident precautions.[129]

The operator is defined as the person exercising a degree of control over a risk connected with the operation and functioning of an AI system.[130] Frontend and backend operators are distinguished from each other. A frontend operator is defined as the person exercising a degree of control over risk related to the operating and functioning of an AI system and benefiting from its operation. A backend operator is a person defining the features of the technology, providing data and support, and also exercising a certain degree of control.[131] The broad concept of the term operator shall ensure a high level of protection by including actors all along the

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Liability: A Comparative Study of "Development Risks" in English and German Law (University of Manchester, 2019), 30-32.

[126] See also e.g. Twigg-Flesner, "Guiding principles for updating the PLD", 10.

[127] EP, *Civil Liability Resolution*, 2020, Annex B (hereafter: EP Draft Regulation).

[128] EP, *Civil Liability Resolution*, 2020, Draft Regulation, Article 4.

[129] See section III.A above.

[130] EP, *Civil Liability Resolution*, 2020, Draft Regulation, Rec. 10.

[131] *Ibidem*, paragraph 12.

value chain.[132] This is at the same time in line with the broad notion of the producer.

Whether future legislation manages to strike a suitable balance will also depend on what the final definition of high-risk applications looks like, and whether it will be interpreted broadly or narrowly. Where AI is truly high-risk, strict operator liability would be in line with how European legal orders have traditionally utilised strict liability: where an activity is inherently remarkably dangerous, and the person or organisation carrying out the activity has a good deal of information on how best to avoid accidents and has a good chance of preventing accidents.[133]

Yet, strict liability is always a powerful incentive or disincentive.[134] Even strict operator liability could deter adoption of new technologies that would ultimately be beneficial for society as a whole. However, when AI is safer than a human in a given task, it is beneficial that humans are replaced by AI.

D. Recoverable harm

Currently, discussion is ongoing as to which types of damage should be recoverable under a future framework on liability for AI and new technologies. According to the EP Draft Regulation, strict liability of the operator would cover "any harm or damage that was caused by a physical or virtual activity, device or process driven by the AI system in question" (Article 4(1)). Additionally, the proposed text sets out some maximum amounts of compensation and further details concerning, for example, compensation for death or injury.[135] Interestingly, it also states that the operator of high-risk AI would also compensate "up to a maximum amount of EUR one million in the event of significant immaterial harm that results in a verifiable economic loss" (Article 5(1)(b)). The relationship between this statement and the more general clause on recoverable harm in Article 4 is not entirely clear. If liability is meant to cover any type of harm, what does it mean that immaterial harm must result in "a verifiable economic loss"?

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[132] See e.g. Büyüksagis, "Responsabilité", 22.

[133] See e.g. Walter Van Gerven, Jeremy Lever and Pierre Larouche, *Cases, Materials and Text on National, Supranational and International Tort Law* (Hart Publishing 2000), 537-598.

[134] See also e.g. Robert Cooter and Thomas S. Ulen, *Law and Economics* (Pearson, 2016), 201-217; [Richard] Posner and William Landes, "The positive economic theory of tort law", *Georgia Law Review* 15 (1980): 851.

[135] EP, *Civil Liability Resolution*, 2020, see Articles 5-6.

More than once, EU bodies have highlighted the danger that AI could present for significant immaterial interests such as human dignity and European values, and that utilisation of AI systems may increase discrimination.[136] Based on that, it appears contradictory to grant compensation only when the harm-sufferer can prove actual economic loss. Under existing EU law, compensation for immaterial or non-material harm is understood as compensation for the non-material harm itself.[137] This includes different types of mental suffering, or, in the case of legal entities, a state of uncertainty. The borderline between non-material harm and economic harm under EU law is not as clear as it maybe should be,[138] but the text of the EP Draft Regulation seems particularly problematic. It is challenging to deduce what exactly is recoverable immaterial harm under the rules proposed by the EP.[139]

It has been suggested that immaterial harm resulting in a quantifiable economic loss could include the loss of a chance, such as a financial profit that was not gained because in the end the expected conclusion of a contract did not happen due to e.g. a decision made by an algorithm.[140] Whether the EU legislators indeed aim at including the loss of a chance as a recoverable harm should be further clarified. There has also been discussion recently as to whether the recoverable damage under the scope of the PLD should be extended to non-material harm such as privacy infringements.[141]

An argument in favour of broadening the scope of recoverable harms is that producers qualifying, at the same time, as data controllers or processors are liable under Article 82 of the GDPR for non-material harm related

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[136] See e.g. Commission, *White Paper*, 2020, 10-12; EP, *Resolution on Civil Liability*, 2020, Draft Regulation, Rec. 3. See also, in terms of the concerns presented by the general public, European Commission, "*Summary Report on the open public consultation on the White Paper on Artificial Intelligence*" (2020), 3.

[137] See e.g. Opinion of Advocate General Wahl delivered on 25 July 2018, *Kendrion*, Case C-150/17 P, EU:C:2018:612, paragraphs 107-110, 124-128; Judgment of 4 April 2017, *Staelen*, Case C-337/15 P, EU:C:2017:256; Katri Havu, "Damages liability for non-material harm in EU case law", *European Law Review* 44, no. 4 (2019).

[138] See e.g. Havu, "Damages liability for non-material harm", 508-513.

[139] See also EP, *Civil Liability Resolution*, 2020, paragraph 19.

[140] See e.g. Büyüksagis, "Responsabilité", 23.

[141] The question was also raised in the ongoing public consultation on civil liability – adapting liability rules to the digital age and artificial intelligence: "Civil liability – adapting liability rules to the digital age and artificial intelligence, Have your say". *European Commission*. https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12979-Civil-liability-adapting-liability-rules-to-the-digital-age-and-artificial-intelligence_en.

to, for instance, privacy infringements. Producers not qualifying as data controllers/processors will not be liable under the scope of the PLD. This might place certain consumers at a significant disadvantage. It could also distort competition or prompt producers who are at the same time data controllers/processors to outsource such activities to circumvent liability. As a result, it may become more difficult for injured parties to identify the correct defendant.

E. Burden of proof

When applying traditional fault-based liability to AI-related harm, where the injured party bears the burden of proof, damages claims could remain unsuccessful due to information asymmetry and the complexity and opaqueness of the respective device. This has also been pointed out in policy papers.[142]

Under the current Article 4 of the PLD, the consumer shoulders the burden of proof in showing that a product is defective and the existence of a causal link between the defect and the damage. The CJEU held, in this regard, that evidence brought forward must be "sufficiently serious, specific and consistent to warrant the conclusion that, notwithstanding the evidence produced and the arguments put forward by the producer, a defect in the product appears to be the most plausible explanation for the occurrence of the damage, with the result that the defect and the causal link may reasonably be considered to be established".[143]

Evaluation reports related to the PLD point out significant difficulties, particularly regarding pharmaceuticals or complex technical products, as injured parties often lack the necessary expertise to conduct the required proof.[144] It has been stated that automated systems usually store data that can be relevant for claimants – the Commission specifically notes that

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[142] See e.g. Commission, *White Paper*, 2020, 13.

[143] Case C-621/15, *W X Y v. Sanofi Pasteur MSD SNC and Others* [2017], ECLI:EU:C:2017:484.

[144] European Commission, *Evaluation of Council Directive 85/374/EEC*, 25; European Commission, *Third report on the application of Council Directive on the approximation of laws, regulations and administrative provisions of the Member States concerning liability for defective products (85/374/EEC of 25 July 1985, amended by Directive 1999/34/EC of the European Parliament and of the Council of 10 May 1999)* COM (2006) 496 final 9, September 14, 2006, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52006DC0496. Even though harm-sufferers' (arguable) difficulties in terms of proving defect and causation were already noted, e.g., in the PLD evaluation report of 2006, this matter did not lead to revising legislation.

modern systems usually have logging possibilities.[145] Whether and to what extent a harm-sufferer has access to this data largely depends on storage location. The chances for the harm-sufferer to use the information will be smaller if it is stored in a cloud or in another location controlled by the defendant. Even if harm-sufferers are in theory able to obtain some of the relevant data, their lack of expertise and the complexity of AI systems might still render showing causation and defect nearly impossible.[146]

One must take into account recital 2 of the PLD, according to which there must be a "fair apportionment of the risks inherent in modern technological production" (between producers and consumers).

In this context, one can ask whether and to what extent the burden of proof should be reversed or alleviated. One could also facilitate access to information for the harm-sufferer by obliging the producer to grant access to the relevant data. Even the introduction of limited and field-specific discovery rules is an option.[147] It appears that AI-related harm is an area where a broad range of options should be considered to make claims less hindered by obstacles in accessing evidence.

According to the EP Draft Regulation, the operator is not liable if they prove that they were not at fault, provided the system was operated without their knowledge despite their having taken all necessary measures to avoid this, or that they observed all due diligence in selecting, monitoring, operating and maintaining the system (Article 8(2)). In this regard, recital 17 of the EP Draft Regulation states that harm-sufferers should benefit from a presumption of fault of the operator.

However, application of the rules by national courts might lead to divergent case outcomes if the final legislative text does not clearly indicate what exactly amounts to proving not being at fault. Without clear criteria, the possibility of fragmentation remains. This is not an unknown risk under existing EU law such as the PLD, either. Absolute harmonisation is highly challenging to achieve, and some variation in applying the law must just be accepted.

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[145] Commission, *Safety and Liability Report*, 2020, 3.

[146] For discussion, see also e.g. Roeland de Bruin, "Autonomous intelligent cars on the European intersection of liability and privacy", *European Journal of Risk Regulation* 7, no 3. (2016): 485, 491-492, 500.

[147] See Directive 2014/104/EU of the European Parliament and of the Council on certain rules governing actions for damages under national law for infringements of the competition law provisions of the Member States and of the European Union, [2014] OJ L 349/1.

Corresponding to the suggestion to align the PLD with a future framework, regulators should also consider a reversal of the burden of proof in terms of product liability.[148]

V. Towards a level playing field

To achieve the level playing field envisioned by EU institutions, it is crucial that existing and future frameworks are consistent and that the rule of national laws is also considered properly.

A. Consistency of frameworks

It is already evident that, in the future, several legal frameworks, including the PLD, the MDR, the GDPR, as well as future Regulations such as the AIA, the AI Liability Regulation, the GPSR or the DSA, will be relevant for damages liability for AI-related harm. Thus, it is crucial that these rules are coherent. The Civil Liability Resolution specifically mentions the necessity to align the future AI liability Regulation with the PLD.[149]

Here, one important point is coherent terminology. However, already at this point one can observe inconsistencies between the legislative proposals. Para 8 of the Civil Liability Resolution states that "following the review of the PLD, the concept of 'producer' should incorporate manufacturers, developers, programmers, service providers as well as backend operators". Pursuant to Recital 10 of the EP Draft Regulation, "if the backend operator also qualifies as 'producer' as defined in Article 3 of the Product Liability Directive, that Directive should apply to him or her. If there is only one operator and that operator is also the producer of the AI-system, this Regulation should prevail over the Product Liability Directive". This approach is likely to generate confusion regarding which framework is applicable in which situation. It is crucial to state, very clearly, when a backend operator is a producer and when they are operators. When low-risk AI is involved, this will determine whether the backend operator is subject to strict liability or fault liability.

A further issue is the notion of user. Recital 11 of the EP Draft Regulation states that, "if a user, namely the person that utilises the AI-system, is involved in the harmful event, he or she should only be liable under this Regulation if the user also qualifies as an operator". The Civil Liability

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[148] See also EP, *Civil Liability Resolution*, 2020, paragraph 8.
[149] *Ibidem*, paragraph 8.

Resolution fails to provide guidance on where to draw the line between operator and user. As being an operator requires a certain degree of control over an AI system, it should be clarified how much control is required to be an operator.

As opposed to that, in article 3 of the draft AIA, user means "any natural or legal person, public authority, agency or other body using an AI system under its authority, except where the AI system is used in the course of a personal non-professional activity". "Using under its authority" could point to a certain degree of control. In this regard, there could be confusion with the term operator as used in the EP Draft Regulation.

In addition, the draft AIA seems to use a notion of operator that differs from that in the EP Draft Regulation. In article 3 of the draft AIA, the operator is defined as "the provider, the user, the authorised representative, the importer and the distributor". Some of these rather relate to parties falling under the scope of producer in the current version of the PLD.

One must also consider the future interrelation of product liability and product safety rules. In the past, the frameworks were not too closely intertwined.[150] There were several revisions of product safety rules, while the PLD has only had one minor amendment.[151] Product safety legislation is genuine consumer protection law, while the PLD, by definition, shall ensure the functioning of the Internal Market. With regard to the Draft AIA, the Commission states that, in the future, it will work "in tandem with applicable product safety legislation" and be complemented by legislation adapting the liability framework.[152]

B. The future role of national laws

Based on the findings above, existing national liability rules would likely provide for predictable outcomes in cases where the role of AI is minor and the conditions of causation and fault do not differ greatly from situations not involving AI. They may be sufficient where a third party intervenes so that this conduct is decisive, not the characteristics of an AI system. Also, in other situations, where identifying persons causing harm is not

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[150] Fabrizio Cafaggi and Horatia Muir Watt, *The Regulatory Function of European Private Law* (Edward Elgar, 2009), 244.

[151] Howells, Twigg-Flesner, and Wilhelmsson, *Rethinking EU Consumer Law*, 263.

[152] European Commission, *Fostering a European approach to Artificial Intelligence* (Communication) COM(2021) 205 final, April 21, 2021, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2021:205:FIN, 2.

excessively difficult, national laws would likely suffice to resolve cases. Case outcomes might not necessarily be identical in every Member State, but they could be sufficiently predictable and reasonable in the light of the law of the Member State in question.

Complex AI systems and value chains may jeopardise the chance of actually obtaining compensation. Proving the claim is nearly impossible unless the information asymmetry between the claimant and the defendant is alleviated. Additionally, without information possessed by actors in the value chain such as data-providers or manufacturers, the injured party is unable to point out whose mistake caused the harm.

The Civil Liability Resolution discusses questions of damages liability substance and the adequacy of existing laws, as well as the goal of making the law more uniform in the EU.[153] Commission documents also illustrate the importance of both goals: addressing AI-related harm sufficiently clearly in terms of the substance of the law, as well as ensuring that case outcomes are, to a certain extent, similar across the Member States.[154] Yet, the official documents are rather vague in terms of the exact measures they consider necessary for harmonisation. Moreover, while EU bodies highlight problems such as claimants' difficulty in showing causation, they do not fully address them by proposing solutions to these issues.[155] It is likely that national laws will cover any subject matter not addressed by EU law rules in force, however their exact future role remains partially open.

National rules on damages liability will likely complement EU rules, for instance, rules of sector-specific legislation where EU law does not include rules on details of damages liability. National laws might need to be interpreted in a certain manner in EU law-related cases in order to comply with the principles of EU law and with the obligation to offer efficient and adequate judicial protection.[156] Additionally, if gaps occur in harmonising EU legislation, national laws play a role in filling those gaps.[157] If there are pieces

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[153] EP, *Civil Liability Resolution*, 2020, e.g. lit. H, lit. I, paragraphs 6, 9, Rec. 8 of the Draft Regulation.

[154] E.g. Commission, *White Paper*, 2020, 14; Commission, *Safety and Liability Report*, 2020, 5-7, 9.

[155] E.g. Commission, *Safety and Liability Report*, 2020, 14.

[156] See e.g. Judgment of 13 March 2007, *Unibet*, Case C-432/05, EU:C:2007:163; Judgment of 16 December 1976, *Rewe-Zentralfinanz e.g. and Rewe-Zentral AG Saarland*, Case 33/76 EU:C:1976:188; Judgment of 9 March 1978, *Simmenthal*, Case 106/77, EU:C:1978:49, paragraphs 17-24.

[157] This can happen although the national courts have the possibility, and last instance courts the obligation, to request preliminary rulings from the CJEU in case of ambiguity of EU law: Consolidated version of the Treaty on European Union and the Treaty on the Functioning of the European Union, OJ C 326, October 26, 2012, Article 267.

of national particular legislation,[158] they will apply to AI-related harm as long as they are not in contradiction with any EU law. Due to the primacy of EU law, EU law takes precedence over conflicting national rules.[159]

VI. Conclusion

AI will be a part of our societies forever – and it will gradually influence more and more aspects of our private and professional lives.[160] EU legislators have started the project of regulating AI and AI-related harm, but the plans and proposals presented so far are relatively preliminary or incomplete.

Policy papers set out ambitious goals on how to utilise AI to the best benefit of society and the economy while ensuring that potential moral and legal problems are adequately addressed. EU institutions have recognised several potential shortcomings in relation to current law and highlighted the need to amend legislation. Applying existing EU legislation to AI-related harm – together with complementing national law – can lead to divergent case outcomes.

The Civil Liability Resolution is the first official EU-level document proposing certain concrete rules. The guiding idea is that general rules on AI-related liability would be adopted without replacing particular legislation on liability in fields where such legislation already exists. Yet, it remains quite far from comprehensive law that would ensure similar case outcomes across the EU. EU institutions have put forward practicable solutions such as operator liability based on the principle that whoever exercises control over a risk should be liable if it results in damage caused to another. Still, fundamental questions linked to the particular characteristics of AI systems remain unanswered or only briefly addressed.

Substantive aspects such as causation, fault and the burden of proof must be considered in light of particular AI characteristics like autonomy, opacity, connectivity and the complexity of the value chain. EU-level rules on AI-related harm should also treat damage to data and non-material harm.

The necessity to align new frameworks with existing ones is only addressed in relation to the PLD. However, as pointed out above, several frameworks will be applicable to AI-related harm. Looking at the EP Draft Regulation, the Draft AIA, and recent Directives such as the Sale of Goods

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[158] See section IV.
[159] Judgment of 15 July 1964, *Costa v. ENEL*, Case 6/64, EU:C:1964:66.
[160] See also e.g. Commission, *Fostering EU Approach to AI*, 1.

Directive[161] or the Digital Content Directive[162], it becomes obvious that hardly any attention has been paid to coherent terminology or to the inter-relation of frameworks in terms of substance. When essential terms like operator are used in completely different ways, or the notion of product differs, the envisioned level playing field will remain utopic.

It will also be necessary to define the division of labour between EU law and national laws. Would clear and predictable national legislation suffice even if case outcomes would differ slightly across Member States as a result?

No future framework should contain periods of uncertainty by design, nor should it provide for additional fragmentation. Avoiding these pitfalls can justify the harmonisation of many aspects of AI liability for the Single Market.

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[161] Directive 2019/771 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the sale of goods [2019] OJ L 136/28.

[162] Directive 2019/770 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the supply of digital content and digital services [2019] OJ L 136/1.

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