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A General Overview of Artificial Intelligence and Its Current Implications in Civil Law

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Abstract. In the course of this study, the author briefly presents some of the major issues raised by the prospect of artificial intelligence (AI) development in the field of civil law. Firstly, problems posed by possible AI agents acting for a natural or legal person (principal) are analysed, with the conclusion that as of yet liability for damage caused by the AI both to the parties of the juridical act concluded by the artificial agent and to any third parties remains with the owner or operator of the AI, with all the injustices this situation entails. Secondly. situations of liability for damage caused by use of an AI system for aiding decision-making are presented. It is shown that liability gaps exist in such situations due to lack of regulation. Thirdly, the possibility of AI-held (mostly non-pecuniary) intellectual rights is analysed, which in the light of current regulation and recent foreign case-law seems excluded. Finally, the possibility of granting legal personality to AI systems is raised as a possible solution to the aforementioned dilemmas. It is shown that this would be only an apparent solution, while legal personality for AI would entail greater risks, and is therefore to be avoided. It is concluded that further research and regulation may be necessary to resolve the problems that were identified.

Keywords: artificial intelligence, civil law, civil liability, artificial agent, intellectual property, legal person

1. Introduction

The topic of artificial intelligence (AI) has come to the fore in recent legal literature. Numerous current discussions are aimed at exploring the implications of new technology in law enforcement, public administration, and justice. The problems

presented by AI are indeed diverse: its complexity and opacity[1] (the inability of some AI applications to give reasons for their actions or inactions the way human beings would and the secrecy resulting from data protection requirements, or the proprietary nature of some of its elements), the existential threat that it may pose to humanity,[2] and the risks it already poses to human rights (be it in the form of mass surveillance or predictive functions[3] used in law enforcement) all must be considered. The legal and scientific literature in fact seems overwhelmed by these topics, whereas AI may also lead to major new developments in several fields of civil law, specifically in the domains of obligations (agency and contractual as well as non-contractual liability) and rights in rem such as intellectual property law, which also raise the prospect of legal personhood.

AI differs from most, if not all, previous technological leaps by its very nature: it is capable of autonomous, even independent action which, unlike in the case of machines or animals, is purpose-oriented. The basic modality in which AI operates presupposes the existence of pre-set goals usually determined by a human operator, data which is input into the AI algorithm from a pool that is provided by humans, and a processing mechanism which based on the input data and the pre-set goals is able to result in desirable outputs. There are several ways to achieve the outputs, which presuppose a greater or lesser extent of human oversight and interaction and which are more or less opaque depending on the particular technological solution used.[4] The exact way in which AI generates the output may be impossible to know or influence even for the most skilled operator due to the nature of the technical solution employed, making it the product of 'machine thought' combined with human-designed elements.

It must also be kept in mind here that the outputs an AI can generate are varied and diverse, unlike the products of any other technology. An AI may produce real-world consequences in ways only human beings could in the past, e.g. by directing vehicles, deciding and conducting business transactions, intelligently conversing, even playing games with humans, providing vital advice to human decision-makers such as doctors and judges, giving medical care or even creating art. There is a myriad of human–AI interactions that set AI apart from any other past technology and demand legal solutions.[5] All this stems from AI being a universal technology, even if artificial general intelligence (AGI), the human-like artificial intellect of science-fiction fame is most definitely a future, or even impossible development.

The functional similarity and possible intertwining between AI outputs and human actions or omissions creates an entirely new landscape to which a regulatory

1 For the meaning and implications of 'opacity' in the context of AI, see Burrell (2016), Chesterman (2021), and Wischmeyer (2020).

2 For an exploration of the long-term risks presented by AI development, see Harari (2017).

3 See Zuiderveen Borgesius 2020, Citron–Pasquale 2014, Knobloch 2018, Bertolini–Episcopo 2021.

4 For a non-technical description of the methods and processes (mainly machine learning and neural networks) on which AI implementations are based, see Boden (2018).

5 See Surden 2019. 1335–1337.

response is necessary, as existing rules cannot be shoehorned to fit new realities. Major problems are posed by AI acting as an artificial agent in legal transactions, as adviser (or replacement) of human decision-makers, and as creator of products protected by intellectual property rights or, indeed, other rights in rem. In the following, I aim to analyse some of these problems and draw some conclusions on regulatory priorities in future civil law norms.

2. AI as an Agent for a Principal

AI agents are an ever more widespread reality.[6] They are employed in economic transactions of various types and are able to interact with human counterparties;[7] they are also able to conclude their transactions based on purposeful autonomous reasoning.[8] These 'artificial agents' are not simple pieces of software executing human-generated orders for buying and selling whatever asset is being traded on a given market but are able to decide whether to conclude a transaction, and under what circumstances to do so. They exercise contractual freedom in a way that is not directly (or even indirectly) determined by their human 'principal' and are prone to the kind of risks any 'human' agent would be: concluding transactions that are egregiously disadvantageous to one of the parties, and therefore infringing on an obligation of contractual loyalty and equilibrium of performances, or exceeding their powers, conducting transactions outside the scope of their activity or failing to conduct transactions that are considered rational by the parties, leading to issues of liability.[9] The principal–agent relationship and also the agent–counterparty relationship must be considered in these situations. If the regulator is to address these issues, either some analogy must be found between the situations autonomous agents create and regulatory models that are already known, or, in the absence of such an analogy, new regulatory models must be invented.

The first and one of the worst problems legal science must contend with when analysing autonomous agents is one inherent to the theory of juridical acts: do these 'machines' possess capacity and will to conclude a juridical act (e.g. a contract) on behalf of another person under the law?[10] In fact, should they even be considered as an agent at all (as under most systems of law only a person may be an agent)?[11] After all, human agents are entitled to act on behalf of another based on a contract between them and their principals.

6 See Milana–Ashta 2021.
7 See March 2021.
8 See Kuo et al. 2021.
9 See Pagallo 2013. 89 et seq.
10 Chopra–White 2011. 29.
11 Tanna–Dunning 2022. 138.

Capacity is understood as a personal competence by the party to act reasonably in the conclusion of juridical acts, weighing advantages against disadvantages and deciding in a rational way for, or against, concluding the act; this definition of capacity is inexorably linked to that of will, as the formation of will requires an ability to conduct a reasoning, the way in which contractual will forms according to the will theory of contract.[12] In the case of an agent acting for a principal, the latter is the one who shall usually pre-determine the elements on which reasoning shall be based (e.g. the type and quantity of assets to be bought or sold, the price range, the date of delivery, etc.) and, as the case may be, even the party with whom the contract is to be concluded. Still, even the basic elements of the contract, such as quantity or price, may be left to the discretion of the agent. Oftentimes they are, specifically when the principal is counting on the acumen of the agent to obtain a better deal. It is in such circumstances that the artificial intelligence agent excels. It may be able to identify and adjust for future predictable circumstances, which are likely to result in an advantage for the principal.

The question is whom we deem liable (if liability can even be apportioned) when the artificial agent concludes a juridical act that is 1. prejudicious to the principal and/or prejudicious to the counterparty, 2. not prejudicious to any party but for some reason also undesired, 3. prejudicious to a third party, or 4. contrary to the law and therefore null and void or subject to similar punitive measures that would at least partly rob it of its efficacy.

The first hypothesis of the first situation is apparently the simplest: since AI currently does not benefit from personhood under the law, it cannot be held liable by the principal for acting in a way that was prejudicious to the former and possibly advantageous to the counterparty. Indeed, if the artificial agent is the product of the principal, this solution should stand. After all, as a rule (which bears some exceptions), no one may claim liability for damage caused to himself or herself by their own tools. Still, AI applications may be developed by third parties then licensed, loaned, or otherwise ceded to the principal. This may take place free of charge, e.g. for testing purposes, when the principal may even assume the risk of malfunctions, as is the case during so-called 'beta-testing', a standard practice when developing information technology applications. It may also take place for some fee, as a service supplied to a client. In the first case, the principal is unlikely to benefit from any liability for damage caused or may benefit only from forms of liability, such as for tort, if the supplier of the AI agent is unable to disclaim liability. In the second case, or in situations when liability cannot be disclaimed (cases of egregious negligence or bad faith by the supplier), questions of contractual liability may arise between the contracting party and the AI supplier.

The second hypothesis of the first situation above is also relatively clear: the AI is not a person, and contractual liability is of a strict character in comparative

12 van der Kaaij 2019. 39.

law,[13] just as some forms of tort[14] law. Therefore, any non-performance by the principle will render it liable to the counterparty.

A problem also known in the case of human agent is constituted by the situations when the agent out of error, or even with bad faith, concluded a contract on behalf of the principal which is per se not disadvantageous to either of the parties but which was not desired by the principal, and therefore the agent acted outside the bounds of the mandate received. The problem of unforeseeable contracting by an AI agent has been discussed in the literature,[15] with the conclusion that in such situations, as the AI system is not a person, it will be legally indistinguishable from the entity which 'employed' it. Therefore, the contract concluded by AI, unlike in the case of a human agent acting outside the scope of his or her mandate, will remain valid and will bind the principal, resulting in liability if non-performance occurs.

If third parties have also suffered some form of damage due to the actions of the AI agent, non-contractual liability must also be considered. In cases of damage caused by an agent under current norms, the principal may be held liable, perhaps with the possibility of a later action against the agent, or the agent may be held liable alone; in situations when damage was caused by the AI agent, however, the principal will have to assume liability alone, perhaps complemented by a later claim against the supplier of the AI system.[16]

A last scenario that may occur is when the contract is concluded between the parties through the AI agent as an intermediary but its efficacy is compromised by the actions or omissions of the AI agent. In such circumstances, the parties may even desire the continuation of the contract, while its being null and void or, as the case may be, avoidable or otherwise unenforceable may result in damage to all of them. As the law stands, fault for the inefficacy of the contract is attributed to the party who caused such inefficacy[17] if the counterparty was unaware of the reasons for it at the moment the contract was concluded. Thus, the reasoning according to which the AI agent is a tool of the principal must again be considered and the principal alone held liable for the inefficacy (with an eventual possibility for submitting a further claim against the provider of the AI system should the damage caused not be subject to a valid disclaimer).

These questions, although known and discussed in the literature, have not yet prompted regulatory action. In fact, contractual liability in case of AI agents is not discussed as a specific topic, not even in the context in which the European Commission has already proposed[18] regulating non-contractual liability in the case of AI. The question arises as to whether extant norms of contract law may be

13 See Menyhárd et al. 2022.
14 See Dam 2013.
15 Tanna–Dunning 2022. 139.
16 Ibid.
17 See Menyhárd et al. 2022.
18 See European Commission 2022b.

sufficient to resolve such situations, whether in fact new regulation is not even necessary.

As we have seen, what sets apart the problems posed by AI agents from those of human agents is their lack of personhood under the law: as things stand, they are simple tools employed for a given purpose, which renders the principal as the sole party responsible for any damage caused by the AI agent, even when its actions are unpredictable or incomprehensible to the principal. The principal may possibly claim damages from the supplier of the AI, thereby pushing the liability issue along the supply chain. While in the realm of contractual liability such a solution seems acceptable at first glance, the fairness of imposing strict liability (between parties) for the actions of an AI may be disputed. After all, the principal in such situations may be held liable for circumstances it is unable to foresee, whereas the occurrence of such circumstances in other elements of the contractual relationship, such as performance (e.g. frustration of performance), would otherwise exempt the party from liability, as seen in comparative law.[19] Even worse, liability towards third parties would be non-contractual; so, whenever the fault of the principal cannot be proven, the supplier of the AI system cannot be held liable. In such cases, a liability gap will result.[20] Such gaps may discourage the use of AI and contacting when the counterparty is aware of AI contribution to the conclusion of the contract. For this reason, strict liability regimes should be adapted and compulsory insurance considered in the case of AI agents.[21]

The problems posed by the AI agent could also, in theory, be treated by granting personhood to the AI entity involved. This in fact would result in the AI itself 'supporting any liability from its own assets in cases when its actions caused damage to another, very much like a human agent would'. Such a prospect has been proposed;[22] however, no consensus has been reached on the matter.

3. Liability for AI Acting as an Aid to Human Decision-Makers

AI applications are already being used as an aid to human decision-making. In this capacity, AI is usually utilized in conjunction with a human controller, or supervisor, who may, depending on the solutions used, either influence or even overrule the AI decision (a solution known as 'human in the loop'[23]).

19 See Veress et al. 2022.
20 Allen 2022, De Conca 2022.
21 See Allen 2022. 155–157.
22 See, for example, Rab 2022. 370–371.
23 Church–Cumbley 2022. 189.

AI-aided human decision-making under this concept raises problems of civil liability. To illustrate this, let us consider the following hypothetical situation: an AI used for medical diagnostics (an activity for which several diagnostic tools[24] are already in existence) detects the presence of a tumour, which would require medical action. In this situation of human–AI interaction, the doctor as the human factor may choose to overrule the AI and set up another diagnosis or may confirm the AI diagnosis resulting in the necessity for long-term treatment of the patient, with numerous side-effects. Two questions are inevitably raised here: 1. what happens if the AI was wrong and damage was caused by confirming it, and 2. what happens if the AI was right, and damage was caused by overruling it.[25]

Based on the fault-based liability model applied to non-contractual liability (liability for tort) by the law of obligations in most civil law and also common law jurisdictions, for the aggrieved party to be able to claim damages, he or she must demonstrate the existence of an illicit conduct (fault) on behalf of the tortfeasor, the existence of damage, and the causality between that fault of the tortfeasor and the damage caused. It is the demonstration of fault and of causality between the fault and the damage caused that is most relevant to our inquiry.

In the first situation (the AI was wrong, and the human confirmed the decision), it is for the aggrieved party to prove that the human factor was at fault, based on all information available to him or her at the moment he or she decided to accept the AI diagnosis. Setting aside numerous difficulties involved in proving malpractice, we would like to focus here on one aspect, called 'automation bias'.[26] In situations of machine-influenced medical decision-making, the human factor interpreting diagnostic results tends to accept these results more readily than to overrule them. This is due to the 'comply or explain' logic, in which the human operator feels he or she must provide a reasoned decision when overruling the machine, while no such reasoning, beyond the existence of the automated advice is necessary when accepting an AI-generated diagnosis. In the latter case, the human factor (doctor) can already defend against future claims for liability by simply invoking the machine decision and the high degree of confidence awarded to it in the medical profession. This reasoning is legally correct, as, unless the aggrieved party manages to demonstrate that the human factor had adequate reason to overrule the AI, a probatio diabolica in its own right in malpractice cases, any non-contractual fault-based liability will be very difficult to invoke, as the human factor would be considered as having acted diligently. Here, civil law tends to reinforce the automation bias.

Similarly, in the second situation (the AI was right but was mistakenly overruled by the human factor), proof of fault may be provided more easily by the aggrieved

24 See Gupta–Prasanna–Raghunath 2021.
25 For a more in-depth analysis of similar hypotheses, see Neri et al. 2020.
26 See Bond et al. 2018.

party, who can invoke the fact that the AI proposed a certain diagnosis, and the AI generally tends to be right. In this case, and contrary to the desired effects of the burden of proof imposed on the aggrieved party, it will be the alleged tortfeasor (the human factor interpreting the AI result) who will face an 'uphill battle' as the burden of proof may be inverted after the aggrieved party invoked the AI diagnosis, so it will be up to the alleged tortfeasor to demonstrate that he or she had adequate reason to believe that the AI was wrong. In this case, it will be the human supervisor of the AI who will find himself or herself in a disadvantaged position.

In both cases, it seems that relying on the AI has massive evidentiary benefits to the party invoking the results of AI advice (be it the alleged tortfeasor or the aggrieved party). Simply put, the AI output will be the most easily obtained evidence in the case. This in itself tends to discourage overruling the AI, as any doctor to do so would have to explain why he or she opted not to comply with AI advice, a strenuous and risky task in case the doctor would later need to demonstrate his or her lack of fault for the damaging outcome. This favours rational optimization, a phenomenon in behavioural law and economics,[27] when relying on the AI has net advantages over overruling it in view of any trial aimed at holding the human supervisor of the AI liable. This phenomenon should be considered as one factor in strengthening the automation bias, not as a subconscious reliance but as a rational behaviour of the human factor called upon to supervise the AI.

The proposed AI Liability Directive[28] for regulating non-contractual liability on a European level in the case of AI causing damage does very little to combat this problem. The complex system of presumptions it employs does not alleviate the evidentiary benefits of relying on an AI output as opposed to overriding it, as the directive only addresses situations of fault during AI development, and not those which occur during its use in hypotheses such as the above in conjunction with a human supervisor, which would remain subjected to domestic rules on non-contractual malpractice liability.

The only true modality of avoiding utility-maximizing behaviour in relying on AI output and avoiding challenging it would be for the AI itself (or another person than the one called upon to confirm or overrule the AI output) to be somehow held liable for the results of its output. One way of doing this is implementing a so-called 'human in command' model of AI supervision, whereby the human factor is not 'in the loop' as a co-decider along with the AI but simply filters out egregiously mistaken outputs and otherwise refrains from examining AI decisions on their merits. This solution, favoured by the proposed EU Artificial Intelligence Act[29] (AIA), posits that any action taken by the AI must be under human control, without requiring the human to examine the AI decision on its merits. This shifts liability

27 Zamir–Teichman 2018. 589 et seq.
28 European Commission 2022b.
29 European Commission 2022a.

from the human in command of the AI to the system's provider (manufacturer) or user (e.g. the medical establishment where a medical AI is operated). This solution helps discouraging over-reliance on AI output to any human factor (even when 'human-in-the-loop' and 'human-in-command' models are applied concomitantly) and helps incentivize AI manufacturer and institutional users to ensure that AI output is reliable, which leads to the development of what some authors have termed 'trustworthy AI'.[30]

Another possible solution would be constituted by granting AI itself some form of (even limited) legal personality, thereby ensuring that the AI itself remains liable for any damage caused. In this model as well, the human supervisor would not have any advantage in not overriding the AI's output, as he or she would not be held personally liable. This solution could also be attained by instituting compulsory insurance for some damage caused by AI outputs. The latter two options, in a different context, were examined by the framers of the AI Liability Directive and the AIA (as results from the early drafts of these instruments); however, neither option was implemented. Especially legal personality for AI proved to be an untenable proposal in the face of opposition towards this prospect, as it would entail more disadvantages than possible advantages.[31]

4. AI and Intellectual Property

Clarity in the rules governing intellectual property, and especially regarding the regime of intellectual property rights in rem,[32] is crucial in order to ensure the development of technology (specifically software) and the furtherance of both sciences and arts. AI systems today are capable of developing software,[33] writing poetry,[34] and creatively generating images reminiscent of the work of human artists.[35] In this context, a myriad of problems arise as to the authorship and, consequently, oftentimes also the 'ownership' of the intellectual property produced by AI.[36]

As we have seen above, AI is not a person, therefore it can claim neither authorship nor ownership of the products resulting from its actions. This leaves open the possibility that AI may in fact act in the benefit of some 'classical' legal person such as a corporation, as a tool, rather than as an author, and therefore any intellectual property rights in rem should rest with the operator of the

30 Thiebes–Lins–Sunyaev 2021.
31 See Floridi–Taddeo 2018.
32 See Rahmatian 2011.
33 Provan 2021.
34 See, for example, the *Poem Generator*.
35 See, for example, *DALL-E 2*.
36 Ihalainen 2018.

AI system. The operator, however, may not be identical with the developer of the AI systems or its owner, so the question immediately arises as to whether these latter persons may claim any rights over the resulting intellectual property asset. Furthermore, a more complex and equally important question can be raised regarding the 'originality' of the work produced, a key aspect of intellectual property law, as originality has in the past been thought of as a specifically human contribution to activities of artistic and technical creation. This problem (also called 'agency' in the literature, although not in the same sense as the agency contract to which we have referred to above) is centred around the AI acting as an autonomous agent[37] which could, in theory, make it a 'creator' in the meaning of artificial intelligence but may also make it a tool for 'intellectual property trolling'.[38] In such cases, the AI-generated content is abused either to formulate claims of intellectual property infringement or to force concessions from owners of intellectual property, especially in cases when copyright is concerned due to claimed similarity of works. After all, AI is only a 'derived' creator, as it acts based on the results of machine learning, and whether artificial creativity may be equated with human creativity is still uncertain.

To date, the specifically original human factor in creativity has been considered a major obstacle in granting intellectual property rights to AI for works produced by it (as stated by the U.S. Copyright Office in its review in the Thaler case).[39]

Therefore, according to the as-of-yet meagre case-law,[40] intellectual property rights cannot be granted to non-human intellects. This raises a specific problem, beyond attribution of a work (which was at stake in the Thaler case), as in rem intellectual property rights have a specific pecuniary content resulting from the exclusivity of use and reproduction granted to the copyright or other intellectual property right owner. As the case law stands, even if AI would be granted legal personality, meaning that it would be able to hold assets and have liabilities in its own name, its specifically non-human nature would make it impossible for it to be considered the author of the intellectual property it 'owns', as it resulted from the AI's actions. This would inevitably lead to confusion, as the author or creator of a work protected as a rule by regulations on intellectual property is considered its primordial owner. Here, the hypothetical legal person AI would come to exercise property rights.[41]

37 Gervais 2020.

38 Ihalainen 2018.

39 See Recker (2022) for some information on a recent U.S. Copyright Office ruling in the *Thaler* case, in which the request for registering an AI as the author of a work was denied on grounds of lack of 'human authorship'.

40 For this case-law, see Free 2022. 233–234.

41 For such proposals, see Davies 2011 and Brown 2021.

5. AI as a Legal Person

The above-described problems posed by various AI implementations, such as the issues concerning AI agents, AI as an aid to human decision-makers, as well as AI taken as a creator of intellectual property, all converge towards the problem of legal personality for (at least some) AI implementations. This possibility has been examined in the literature.[42] The consensus of most authors on the topic is that some form of legal personhood may be awarded to AI in the future. The authors state, among other considerations, that the legal difficulties caused by the problems involving agency, effects of AU decisions, and intellectual property rights for AI-generated content would be solved by granting legal personhood to AI systems. These would have rights and obligations, hence would own assets and would be subjected, if need be, to regimes of civil liability. In this context, a regime similar to that of corporate legal persons would become applicable to AI entities.

This solution, which was initially even considered by the European Commission when drafting the AIA, was strongly contested[43] by other authors. The main arguments for this position referred to the fact that, as is the case with legal persons currently in existence, ultimately a human being or group of human beings and not the AI would have to bear the consequences of the AI's actions or inactions. Furthermore, by deliberately underfunding legal persons constituted by AI systems, liability for damage caused would be avoided, and a moral hazard would result, which would run contrary to the desideratum of creating 'trustworthy AI',[44] which is contingent upon a high degree of accountability for AI developers and operators. As things stand, such operators and developers of AI systems are, of course, humans. Finally, a good deal of criticism resulted from the lack of any obvious advantage that would result from granting legal personality to AI, as the issues of agency and liability may be resolved based on compulsory insurance and respect for the precautionary principle. Considering these reasons, the AIA proposal was finalized and published without legal personality for AI mentioned in its text.

6. Conclusions

In my study, I have outlined some of the 'neuralgic points' of the interaction between AI technology and civil law. As is apparent, these points and the potential problems of legal science and doctrine they entail are far removed from the specifically public law issues, or at the very least issues concerning both private and public law, which are much more abundantly referred to in the literature, especially the problems of

42 See Andrade et al. 2007, Calverley 2008, Kurki 2017, Solaiman 2017, Schirmer 2020, Mik 2021.
43 Floridi–Taddeo 2018, Jowitt 2020.
44 Thiebes–Lins–Sunyaev 2021.

bias, e.g. in criminal and in administrative adjudication or during assessment of job applications. I believe that the consequences of AI technology in the field of private law should not be overlooked, as most daily interactions with AI systems will occur in the context of private law relationships: while concluding contracts, while working, travelling, or even staying at home. Even if the need for regulating AI–human interactions in the domain of private law seems less stringent, it is likely to increase exponentially in the future; therefore, we propose conducting further research to determine the optimal legal regime for these interactions. A good starting point for this research would be to assess the efficiency of the AI Liability Directive as the newest proposed addition to European Union private law, once the directive enters into force.

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