

Artificial Intelligence and the Challenge to Traditional Civil Liability Rules

Sana Meramria

University of Larbi Ben M'hidi - Oum El Bouaghi

Email: Sana.meramria@univ-oeb.dz

Abstract :

This study examines the legal issues arising from the development of artificial intelligence technologies, particularly in relation to liability for damage caused by intelligent systems. The autonomous ability of these technologies to learn and make decisions weakens the effectiveness of traditional civil liability rules and raises questions about who should bear responsibility: the programmer, the user, or the system itself. The study explores the possibility of granting legal personality to AI and adapting strict liability rules, such as product liability, to hold these systems accountable. It concludes that the current legal framework is insufficient and requires legislative reform to protect individuals and keep pace with technological progress.

Keywords: Artificial intelligence, tort liability, legal personhood, product liability, liability for the acts of things.

Received: 23/08/2025 Accepted: 25/03/2026 Published: 18/04/2026

Introduction:

The current era is witnessing a radical transformation driven by the dominance of artificial intelligence (AI) technologies, which have become deeply embedded in vital sectors such as justice, education, medicine, and engineering. As these intelligent systems, capable of mimicking human behavior through self-learning algorithms, continue to evolve, new legal challenges have emerged. These challenges particularly concern errors potentially committed by AI technologies, raising critical questions about the extent to which traditional civil liability rules are capable of addressing these advancements and determining responsibility for the resulting damages.

Given this reality, the need for effective legal intervention has become evident. This could be achieved either by amending existing legal frameworks or establishing new regulations to strike a balance between leveraging these technologies and mitigating their risks. The significance of this research lies in addressing a genuine legal gap that may cause confusion in applying current laws, particularly in civil law and liability for damages. This necessitates developing a modern legislative framework capable of keeping pace with this technological revolution.

This research problem centers on the question of whether artificial intelligence technologies can be held accountable for the consequences of their errors, and whether traditional civil law provisions are sufficient for determining liability. Alternatively, does the situation require creating a specialized legal framework to establish what might be termed "Intelligent Civil Liability" to regulate the use of these technologies and assess their malfunctions?

To address this problem, the research will employ analytical and inductive approaches by examining existing legal systems concerning tort liability related to intelligent technologies. Where necessary, a comparative methodology will be utilized to review various experiences and derive appropriate solutions.

Accordingly, this study is structured around two main sections:

Section I: The legal nature of artificial intelligence technologies.

Section II: The extent to which tort liability rules can be applied to artificial intelligence technologies.

Section I: The Legal Nature of Artificial Intelligence Technologies

A) The Concept of Artificial Intelligence

Artificial Intelligence (AI) is a contemporary concept that has yet to receive a unified definition from legislators, leaving room for legal scholars to propose a variety of definitions. The term consists of two parts: "intelligence," referring to the capacity to understand and learn, and "artificial," referring to that which is man-made and distinct from the natural.¹

Most definitions agree that artificial intelligence is a field within computer science aimed at developing systems capable of simulating human thinking and behavioral characteristics,² either independently or with minimal human intervention. This understanding is also reflected in the definition provided by the World Intellectual Property Organization.³

Upon closer examination, artificial intelligence operates by simulating human thought patterns and decision-making processes through the study and analysis of human behavior via computer systems.⁴ It does not constitute genuine human intelligence, but rather an imitation thereof, relying on algorithms and programming without attaining the level of human consciousness or cognition.⁵

Moreover, it is not sufficient for a program to operate using a specific algorithm to be considered artificial intelligence. Rather, it must be capable of self-learning, data processing, and making decisions based on the analysis of that data.⁶

It is important to distinguish between artificial intelligence and machines. While every artificial intelligence system may operate within a machine, not every machine possesses the characteristics of artificial intelligence. AI refers to a programmed system with intelligent features that often functions without direct human intervention, in contrast to traditional machines that rely entirely on human commands.

Artificial intelligence systems vary significantly in their capabilities, ranging from simple, task-specific models to more advanced systems designed to simulate human intelligence more broadly.

Artificial intelligence can be categorized into three main types:

First, narrow or weak AI, which is the most common form and performs specific tasks within a defined environment, such as translation software or image analysis programs.⁷

Second, general or strong AI, which is a more advanced model capable of learning, adapting, and making decisions without predefined rules. However, this type of AI is still in the research and development phase.⁸

Third, superintelligent AI, which remains a theoretical concept. It is anticipated to surpass human intelligence in all domains and currently exists only in the realm of science fiction.

B) Types of Autonomous Robots

Autonomous robots are those that rely on artificial intelligence algorithms and machine learning, enabling them to make decisions without direct human intervention. Among the most prominent examples are self-driving cars, which use sensors and technologies such as radar, LIDAR, and GPS to analyze their surroundings and make driving decisions.⁹ The Society of Automotive Engineers (SAE) has classified six levels of driving automation,¹⁰ ranging from Level 0 (no automation) to Level 5 (full self-driving without any human intervention). However, current vehicles are still in the testing phase and do not exceed Level 2 automation.

The second type is unmanned aerial vehicles (UAVs), commonly known as drones. These vary in size and application and are employed in both military and civilian fields, such as rescue operations, delivery services, and environmental monitoring. These aircraft have been developed to include sensors and advanced systems that enable autonomous decision-making. They are used to carry out precise tasks in complex environments, including scientific missions in oceans and even outer space, thereby enhancing their operational autonomy.¹¹

As for the *intelligent agent*, it refers to a type of autonomous software capable of operating within a specific environment without direct guidance.¹² It interacts with its surroundings in order to accomplish defined tasks. An intelligent agent is characterized by features such as autonomy, the ability to interact with its environment, and proactiveness in decision-making.¹³

Intelligent agents are generally classified into three types: passive agents, which interact within the user's environment; active agents, which collect and analyze data; and transactional agents, which are capable of entering into contracts.¹⁴ Intelligent agents are used in various fields, including e-commerce, email management, and financial control, as demonstrated in systems such as *Maxims* and *WARREN*.

In addition to the aforementioned types, there are other forms of autonomous robots, such as social care robots for the elderly and medical surgical robots. These are advanced applications that reflect the growing scope of artificial intelligence in serving human needs. Such robots demonstrate an increasing ability to intelligently interact with surrounding conditions and make critical decisions in complex environments, further reinforcing the role of autonomous robots as a cornerstone in the future of technology and artificial intelligence.¹⁵

C) The Legal Framework for Artificial Intelligence Technologies

In light of the rapid development of this technology, some legal systems, most notably the European Union, have taken the initiative to enact legislation that keeps pace with this progress. In 2017, the EU adopted a specific legal framework on robotics, which included the formal recognition of the robot as an "electronic agent" or a "quasi-human,"¹⁶ rather than merely classifying it as an "object." This represents a fundamental shift in the legal perspective toward these technologies.

In the same context, the United States issued, in the same year (2017), a law entitled "*The Future of Artificial Intelligence and Its Prospects in the World*", with the aim of regulating the use of these technologies and outlining their future frameworks. As for the European Union, it continued to develop this legal framework by issuing, in 2019, a set of guidelines

to steer the development of artificial intelligence in accordance with ethical and legal standards. Then, in April 2021, it adopted a new legal regulation aimed at classifying AI systems based on their level of risk into three categories: prohibited practices, high-risk systems, and low-risk systems.

Today, the European Union is at the forefront of legal systems seeking to regulate artificial intelligence, having introduced a draft law that imposes strict limitations on the use of this technology. This proposal has sparked wide-ranging debate between supporters, who view it as a pioneering step toward safeguarding rights and freedoms, and critics, who consider it an obstacle to innovation and technological advancement. This reflects the legal and ethical challenges involved in balancing the freedom to develop technology with the protection of individuals.

D) The Legal Characterization of Artificial Intelligence Technologies

In examining the legal characterization of artificial intelligence technologies, it is necessary to present two opposing positions: one in favor and the other against, each based on its respective arguments. At the same time, a third, conciliatory view has emerged, seeking to propose a balanced legal model. These approaches will be outlined as follows.

1. The Opposition to Recognizing Legal Personality for Artificial Intelligence

Proponents of this view argue that such entities lack the fundamental elements required for legal personality,¹⁷ Proponents of this view argue that such entities lack the fundamental elements required for legal personality Proponents of this view argue that such entities lack the fundamental elements required for legal personality such as consciousness, will, and independent decision-making. They emphasize that artificial intelligence remains dependent on human input in terms of programming and operation,¹⁸ and therefore cannot be held legally liable in an independent manner.¹⁹ According to this perspective, legal responsibility should remain with users or developers.²⁰

2. The Position Supporting the Recognition of Legal Personality for Artificial Intelligence

The proponents of this view argue for the necessity of granting advanced robots legal personality,²¹ similar to the legal status granted to corporations. This is justified by their ability to perform complex tasks and make decisions independently. This position is based on the rapid advancement of artificial intelligence and the need to establish a clear legal framework that facilitates its regulation, particularly in areas where intelligent systems are integrated with economic and social activities.

Supporters further justify their position by arguing that legal recognition would enhance the effectiveness of legal accountability and help regulate potential damages caused by such systems. It would also ensure the respect of their dignity and protection from exploitation, particularly in the event that these systems evolve toward possessing some form of sensation or partial awareness. They believe that granting legal personality would facilitate the application of laws and contractual obligations to robots and would align with ongoing technological advancements.

In light of this divergence,²² a conciliatory juristic approach has emerged, advocating for the recognition of a virtual or limited legal personality for artificial intelligence, proportionate to the nature of its actions and degree of autonomy. This view proposes the establishment of a special legal framework that grants certain rights and obligations to robots, without equating them with human beings or traditional legal entities. The aim is to strike a balance between protecting society from the risks posed by these technologies and supporting technological advancement within a responsible legal framework.

Section II: The Possibility of Applying Tort Liability Rules to Artificial Intelligence Technologies

The application of tort liability rules to artificial intelligence technologies presents several challenges, particularly in identifying the natural or legal person responsible for the harm caused by the actions of such technologies. Since artificial intelligence cannot be considered a person, can liability for the custody of things be applied to it (Section One)? Or is the adaptation of product liability for damages caused by defective products more appropriate for AI technologies (Section Two)?

A) Applying Guardian Liability for Harm Resulting from Artificial Intelligence Technologies

Tort liability for the guardianship of things has received the attention of the Algerian legislator, as regulated under Article 138 of the Civil Code, which states: *"Anyone who assumes guardianship of a thing and has the authority to use, manage, and supervise it shall be liable for the damage caused by that thing."*

Exemption from liability shall be granted if it is proven that the damage resulted from a foreign cause beyond one's control, such as the act of the victim, the act of a third party, or force majeure."

In French legislation, Article 1242 of the French Civil Code establishes the same principle, stating:

"A person is not only liable for damage caused by their own act, but also for damage caused by persons for whom they are responsible, or by things under their guardianship."

It is understood from both provisions that they pertain to damage resulting from the object under guardianship, not to damage inherent to the object itself, and that they apply to harm caused to others, not to harm suffered by the guardian.

Defining the concept of guardianship also represents part of the problem. Even if we acknowledge that artificial intelligence technologies may be subject to guardianship, it remains difficult to determine who the guardian is. The content of both legal provisions assumes that the guardian is the owner. However, the legitimacy of this assumption is diminished in the case of intellectual property, where ownership of the software is attributed to its creator or rightful owner.

Assuming a presumption of guardianship lies with the user of artificial intelligence would not have a positive effect, since the same AI system may be used by an unlimited or indefinite number of individuals.²³

In addition, artificial intelligence technologies are, by their nature, designed to be autonomous and independent, free from any oversight or direction by their guardian, regardless of whether that guardian is the designer, owner, or user.

It is observed from both legal provisions that each refers to a “thing” in general terms, without specifying its nature or type. This allows the concept to be interpreted broadly to include both tangible and intangible objects.²⁴

However, applying the notion of guardianship to artificial intelligence technologies raises several issues:

- **First**, it is difficult to determine who the legal guardian of an AI system is. The concept of a guardian in traditional tort liability presumes actual control, use, and management, conditions that are difficult to meet in the case of self-learning intelligent systems.
- **Second**, there is an overlap between the holder of intellectual property rights (the designer or developer) and the end user, which creates ambiguity as to who should be held responsible for harm resulting from the conduct of the AI.
- **Third**, artificial intelligence is characterized by its autonomy in decision-making and may engage in actions that were neither anticipated nor pre-programmed. This undermines the element of control and supervision, which is essential to the concept of guardianship.

For example, when discussing self-driving cars, one of the most prominent applications of artificial intelligence, we find that these vehicles make decisions based on data collected from multiple sensors that gather information about the surrounding environment. Fatal accidents have already occurred, the most notable of which took place in March 2018, when a self-driving car struck a woman in the United States, resulting in her death. Despite the controversy that arose regarding liability, testing of these vehicles continued on the grounds that human driving errors are more frequent and often more severe.

Accordingly, applying tort liability for the guardianship of things to artificial intelligence, in its traditional sense, appears insufficient to account for such realities. It has therefore become necessary to reconsider the concept of the object under guardianship and to expand it to include intangible elements such as software outputs, or at the very least, to establish a specific form of liability adapted to the nature of intelligent systems.

Given the limitations of this application, it is essential to explore alternative legal frameworks for addressing civil liability arising from AI-related errors, including the concept of liability for defective products.²⁵

B) Applying Product Liability to Errors Caused by Artificial Intelligence Technologies

Liability for defective products is a modern legal concept based on a relatively new system that has drawn the attention of both legal scholars and legislators. It has been shaped in part by various international agreements. In Algeria, this type of liability is governed by Law No. 09-03. Similarly,²⁶ on July 25, 1985,²⁷ the Council of the European Union established a legal regime for liability for defective products, which remains the applicable framework in Europe for addressing civil liability arising from risks inherent in technological production.

Article 6 of Directive 85/374/EEC defines a defective product as: *“a product that does not provide the safety which a person is entitled to expect.”*

The Algerian legislator addressed the concept of a product in Article 3 of the law on consumer protection, defining it as *“any good or service that may be the subject of transfer, whether for consideration or free of charge.”*; This raises the question: can artificial intelligence technologies be considered a product?

If we attempt to apply the concept of a product to artificial intelligence technologies, it becomes clear that the intangible component of AI, which stems from human input, constitutes an intellectual creation linked to copyright. This makes its classification as a product questionable.

AI operates primarily in its immaterial dimension. It cannot be considered a product unless it is embodied in a physical, tangible medium. The product must therefore be of a material, not intangible, nature.²⁸

This form of liability for defective products is based on the condition that the product contains a defect, namely, that it lacks the expected level of safety and security.

However, adapting product liability to damages caused by artificial intelligence technologies requires distinguishing between two situations.

The first is when AI is used in connection with a specific physical carrier, such as the physical design of robots or the microchips embedded in intelligent systems. In this case, there is no obstacle to applying product liability. The manufacturer bears responsibility for compensation based on strict liability.

Accordingly, liability arises for the producer of artificial intelligence technologies with a physical carrier for the damages caused by these defective technologies. The manufacturer, like any original producer, is held accountable for the harm caused by defective AI systems, whether they contributed to their production in whole or in part, in accordance with the provisions of the European Directive.

It is known that the European legislator adopted a new theory as the basis for civil liability regarding intelligent robots, referred to as the “**human surrogate**” theory. This is the person whom the French legislator termed the “**robot’s counterpart**.” The surrogate is deemed responsible for compensating the injured party as a result of operating the robot, based on fault liability, which must be proven against the surrogate, who may be the manufacturer, operator, owner, or user of the robot.²⁹

It is important to note that the notion of artificial intelligence operating through machines, specifically robots equipped with self-directed deep learning systems, was one of the main reasons that led the European legislator to recommend granting such machines certain attributes of legal personality. This was not intended merely to protect the machines themselves, but rather to protect society from their irrational or unlawful use, given that these machines possess both a tangible physical presence and a directed cognitive capacity that cannot be ignored.³⁰

However, recognizing artificial intelligence as a legal person or entity would result in manufacturers and other responsible parties being absolved of liability. This would open the door wide for producers to evade responsibility for the actions of their devices, for defects related to software data and training, and for any harm that may be caused to third parties.

The case of artificial intelligence used without a specific physical carrier: such as algorithms and software: In this case, if artificial intelligence is viewed as a set of algorithms, even if all possible outcomes were anticipated by the programmer, it remains difficult to apply product liability, particularly in systems capable of deep learning and making autonomous decisions. This creates challenges in proving the existence of a defect in the product. Even if such defects were present at the time the product left the hands of the manufacturer or developer, it is difficult to draw a clear line between damage resulting

from artificial intelligence based on its autonomous decision-making and damage caused by a defective product.³¹

Accordingly, applying product liability may be suitable for compensating damage caused by intelligent systems in certain cases only. However, it falls short when it comes to addressing harm caused by self-learning systems that generate algorithms independently.³²

Thus, applying product liability to errors arising from artificial intelligence technologies faces significant challenges, including the following:³³

- Artificial intelligence technologies cannot be controlled, as risk is inherent in their functionality, making them a source of general hazards.
- It is difficult to identify a product defect in situations where the harm results from behavior learned by the intelligent system from the environment in which it is used. Consequently, it also becomes difficult to precisely determine the malfunction that caused the damage.³⁴

The provisions of this form of liability are no longer sufficient in light of the emergence of new generations of artificial intelligence technologies based on machine learning and autonomous decision-making. Moreover, holding the manufacturer or programmer of the AI system liable is, in some cases, illogical. This is because the system's deviation in behavior may not be linked to its manufacturing or programming, but rather to evolving real-world circumstances that cannot be fully anticipated or contained within the manufacturing or programming process.³⁵

It is difficult for the claimant to prove the existence of defects in artificial intelligence products, especially when such defects were present at the moment the product left the hands of its manufacturer or developer.³⁶

It is worth noting that the French Parliamentary Office for Scientific and Technological Assessment concluded in its report issued on 15 March 2018 that the burden of compensating for damage caused by artificial intelligence technologies should fall,³⁷ depending on the case, either on the designer of the AI system or on its manufacturer, in accordance with the general principle.

This position aligns with the recommendation previously issued by the European Parliament in its resolution of 17 February 2017, which included proposals on the application of civil law rules to robotics.³⁸

Conclusion

At the end of this study, it is clear that the traditional rules of tort liability, as established in most civil law systems, are insufficient on their own to address the complex legal challenges posed by artificial intelligence technologies. Given the capacity of these systems to make autonomous decisions and to engage in self-learning, it becomes difficult to determine liability in accordance with classical concepts such as the guardian or the producer. This reinforces the necessity of a comprehensive review of the current legal framework, both conceptually and procedurally, to keep pace with this technological shift. Based on the findings reached, it is evident that an effective legal response requires the adoption of a "smart civil liability" system that accounts for the unique characteristics of artificial intelligence. Accordingly, the following recommendations are proposed:

1. Enact dedicated legislation regulating the use of artificial intelligence, including precise definitions and a clear delineation of legal responsibilities arising from its use.
2. Introduce a limited or virtual legal personality for intelligent systems, allowing them to bear the consequences of their actions within a defined legal structure.
3. Strengthen oversight mechanisms over developers and users, and impose obligations to ensure safety and transparency standards are met.
4. Promote international cooperation to harmonize legal rules governing artificial intelligence, in light of the transboundary nature of these technologies.

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