

Civil Liability Damages due to Smart Robot Errors

المسؤولية المدنية للأضرار الناجمة عن أخطاء الروبوتات الذكية

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Abstract:

The study seeks to frame civil liability for damages caused by smart robots Algerian law, confronting the legal problem of determining who bears responsibility when autonomous robots act without human intervention. Employing a descriptive-analytical methodology that surveys scientific and legal literature, doctrinally analyzes the Civil Code Code, the research classifies three possible legal frameworks—robots as objects subject to holder liability, as defective products governed by product-liability provisions, or as independent legal persons. The results reveal that granting robots independent legal personality exposes manufacturers and users to liability vacuums and inequitable compensation mechanisms, thus necessitating a precise legal regime adapted to the nature and operation of autonomous robots; the recommended hybrid scheme treats robots primarily as objects under and product-liability for manufacturing defects, and incorporates statutory provisions for autonomous decision-making, while also mandating insurance, technical standards, and safety audits.

Keywords : Smart Robots; Civil Liability; Legal Status; Personal Liability; Strict Liability.

ملخص:

تميزت الروبوتات بخصائص سهلت حياة الإنسان، غير أن زيادة التعامل معها كان له تأثير كبير على الجانب القانوني، مما خلق مشكلة قانونية تتمثل في من يتحمل المسؤولية عن الضرر الناجم عند استعمال هذه الروبوتات الذكية، وتهدف هذه الدراسة إلى تأطير المسؤولية المدنية عن الأضرار التي تحدثها الروبوتات الذكية باعتماد المنهج الوصفي والتحليلي من أجل تحديد طبيعتها القانونية ومركزها القانوني في القانون الجزائري، بحيث أنه تعرض البحث إلى تبيان الطبيعة القانونية من خلال اعتبار الروبوتات الذكية من قبيل الأشياء ويحمل المسؤولية لحارسها، أو اعتبارها كمنتج وتطبيق عليها نظرية المنتجات المعيبة في التعويض، أو يمكن منح شخصية قانونية مستقلة للروبوتات ومسئولتها مباشرة عن الأضرار التي تسببت فيها للغير. وقد أظهرت نتائج البحث أن الاعتراف بالشخصية القانونية للروبوتات الذكية يشكل خطورة بحيث تؤدي إلى تنصل منتجي ومستخدمي الروبوتات من مسؤوليتهم، وهذا ينجر عنه عدم وجود آلية قانونية لجبر المضررين من مخاطر أخطار الروبوتات، وهذا يستدعي من المشرع وضع نظام قانوني دقيق يناسب طبيعة الروبوتات وطريقة عملها.

الكلمات المفتاحية: الروبوتات الذكية؛ المسؤولية المدنية؛ المركز القانوني؛ المسؤولية الشخصية؛ المسؤولية الموضوعية.

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Introduction:

The human-machine relationship, deeply entrenched in industrial evolution, has traditionally been viewed as an interaction between humans and inanimate objects. Historically, as the creators, operators, and controllers of machines, humans were responsible for any resulting damages, governed by general principles of civil liability¹.

However, the technological landscape has dramatically changed in recent decades, marked by the advent of computers, the proliferation of the internet, and subsequent advancements in remote communication technologies, climaxing with the rise of artificial intelligence (AI). The latter has infiltrated a wide array of human activities² across various sectors including industry, commerce, engineering, medicine, education, agriculture, domestic services, marketing, and entertainment. The appeal of AI lies in its ability to enhance efficiency, improve productivity, and adapt swiftly to dynamic environments.

Currently, AI is most prominently embodied in robots. These robots, equipped with self-learning algorithms, neural networks, and other sophisticated tools³.

The reason for this is that intelligent robots enjoy self-learning, which has given them independence and led to their rebellion against humans and their escape from their control and direction. The real problem is not the existence of the machine, which has existed since ancient times, but rather the problem is its independence from man, its departure from his control, and its individual behavior. The importance of research lies in civil liability for the mistakes of smart robots, especially with their sweeping over human life, as they have become relied upon in various fields, including medical and educational, which results in many damages that require legal intervention to determine liability and protect affected individuals, so that they are not considered incapable of framing developments and organizing society.

The importance of research lies in civil liability for the mistakes of smart robots, especially with their sweeping over human life, as they have become relied upon in various fields, including medical and educational, which results in many damages that require legal intervention to determine liability and protect affected individuals, so that they are not considered incapable of framing developments and organizing society.

Accordingly, this study aims to determine the adequacy of traditional rules of civil liability for the applications and work of robots, while trying to fill the shortcomings that may face those affected, whether the act of robots comes from a contract, law, or something else, especially with the multiplicity of people contributing to the production of intelligent robots.

Hence, jurisprudence, legislation, and ijthad have attempted to keep pace with these developments in contemporary life, in order to maintain a balance between the interests of individuals, without neglecting the victim's right to compensation for the damages they suffer. Therefore, the seriousness of the rapid development of intelligent robots must be explained from the perspective of civil liability by highlighting the liability arising from the use of intelligent robots, in addition to defining the nature of this liability and the effects that may result from it. Hence, the problem arises: How sufficient are traditional civil liability rules to appeal to damages caused by intelligent robots?.

To answer this problem, we adopted a descriptive and analytical approach to provide an accurate and clear description of intelligent robots, their connection to legal personality, and the extent of their impact on the law, whether negative or positive, with the possibility of creating an independent legal personality that is consistent with the nature of robots.

This is what we will address by dividing the study into the first section, which addresses the objective liability of robots for damages arising therefrom under Algerian law, and the second section, which addresses the personal liability of intelligent robots under Algerian law.

Section One: Strict Liability for Damages Caused by Robots under Algerian Law

Researchers generally classify robots into three distinct generations. The first generation comprises robots designed to execute pre-defined tasks without any capacity for environmental adaptation. The second generation, often termed "interactive robots," includes machines equipped with sensory mechanisms enabling them to interact with their environment, such as autonomous vacuum cleaners. The third and most advanced generation consists of cognitive or intelligent robots, which are capable of self-learning from experience, data analysis, and independent decision-making. These robots often perform actions that are unpredictable and outside the control of their creators, programmers, owners, or operators⁴.

unequivocally, distinctive characteristics of robots, particularly intelligent robots, introduce significant legal complexities and present a challenging field of research for legal scholars. One of the primary issues arises from the fact that users of robots or applications often lack control over their actions. Consequently, these users cannot be held accountable for the damages caused by such robots, highlighting a critical challenge in addressing liability issues associated with artificial intelligence technologies.

The key question thus arises: given that robots are generally categorized as mechanical devices, can their custodians be held liable for harm caused by such robots? Under Algerian civil law, individuals are not only liable for damages resulting from their actions but also for harm caused by objects under their custody. However, this type of liability requires the injured party to prove that the custodian exercised actual control over the robot at the time the harm occurred.

Another perspective considers robots as products. This view requires the injured party to establish that the robot contained a defect, that harm was incurred, and that there exists a causal relationship between the defect and the harm. This section addresses these two potential approaches: first, it examines the liability of custodians for damages caused by robots, focusing on their classification as objects for which custodians may be held responsible. Second, it explores the alternative classification of robots as products, analyzing the resulting liabilities under defective product liability principles.

A- Liability of the Robot Custodian for Third-Party Damages

Some legal scholars argue that liability for damages caused by robots should be categorized under custodial liability for objects, a form of *responsabilitas obiectiva* (strict liability). This concept assumes that the object causes harm to a third party, irrespective of any fault on the part of the custodian; instead, liability hinges on the status of the custodian. Importantly, the custodian's conduct or fault is irrelevant to the establishment of liability; rather, their legal status as custodian forms the basis of their responsibility.

This principle is enshrined in Article 138 of the Algerian Civil Code, which provides:

Anyone who has custody of an object and possesses the power to use, manage, and control it shall be held liable for damages caused by that object."

From this provision, it is clear that a custodian—defined as an individual exercising authority over an object through use, management, and supervision⁵—is legally responsible for harm caused by the object. The critical question is whether the owner of a robot qualifies as its custodian and, if so, whether this custodial relationship imposes an obligation to compensate for damages caused by the robot.

However, applying custodial liability to robots presents practical challenges. Determining whether the harm was caused by the robot's components, programming, or operational context complicates the injured party's ability to establish causation. This undermines the primary objective of custodial liability, which is to alleviate the injured party's burden of proving fault or causality.

Under general legal principles, a custodian may absolve themselves of liability only by demonstrating that the damage resulted from an external cause, beyond their control. External causes include a major force—an unforeseeable, unavoidable event external to the custodian's actions. Additionally, the custodian may be exonerated if the injured party's own fault (*culpa victimae*) contributed to the harm⁶. If, however, the cause of the damage remains indeterminate, the custodian remains liable. Furthermore, custodians cannot escape liability if the harm resulted from a design flaw in the robot that caused it to malfunction⁷.

Consequently, applying custodial liability appears to be a suitable framework for simpler assistive robots. However, complexities arise when determining custodianship at the time of harm, particularly when the robot has temporarily passed into another person's control. In such cases, the legal concept of transferred custody may apply. This allows custodial liability to shift to a person entrusted by the owner with the robot's use, storage, or supervision, provided that the transferee exercises authority over the robot.

Intelligent robots, characterized by their ability to execute decisions and actions that are immeasurable, undefined, and unpredictable, operate without adherence to predefined programs. Instead, they autonomously gather, analyze, classify, and integrate data, executing decisions independently of any human input from manufacturers, programmers, owners, or operators. This level of autonomy, facilitated by real-time interaction with the robot's environment, renders traditional expectations of control and predictability obsolete.

The capability for self-learning inherent in artificial intelligence technologies allows robots to evolve beyond even their programmers' foresight. Programmers of AI systems, who set the foundational decision-making rules, cannot predict the behavior these systems ultimately exhibit, as the robots are capable of making independent decisions without external intervention. This independence effectively places them outside traditional human oversight and control.

Given these characteristics, the traditional principle of custodian liability, which assumes control and oversight by the custodian, proves inadequate for intelligent robots. While this principle may apply to conventional robots under direct human control, intelligent robots distinguish themselves by their ability to learn from experiences, make autonomous decisions, and act without direct human commands. Thus, they do not fit neatly within the framework that defines custodian liability, where the custodian's control or oversight directly influences liability⁸.

Moreover, attributing liability to a custodian for all errors committed by a robot, including those stemming from intrinsic design flaws in the AI, is not only impractical but also misaligned with the operational realities of intelligent robotics. Robots incorporate software—an intangible component—complicating the determination of who holds custodianship and is thus responsible for any resultant damages.

In response to these challenges, contemporary legal scholarship advocates for an objective criterion to evaluate the liability of AI systems, focusing on their functional autonomy. This approach gains particular relevance with the proliferation of big data and advances in algorithmic science, which enable AI applications to independently develop operational rules. Through continuous data analysis and organization, intelligent robots engage in self-reprogramming, thereby achieving advanced expertise over time through experiential learning⁹.

The capabilities of intelligent robots are fundamentally rooted in deep learning processes. These processes evolve as the robots are exposed to extensive datasets, enabling them to derive their operational behavior independently of any pre-programmed instructions by humans.

B- Liability of Robots as Defective Products

Under the Algerian law, particularly paragraph 10 of Article 03 of Law No. 03-09¹⁰ related to consumer protection and fraud suppression, a product is defined as any good or service that can be the subject of a transfer, either for a consideration or free of charge. Additionally, Paragraph 2 of Article 140 bis, introduced by Law No. 05-10 of the Civil Code, broadly categorizes a product as any movable property, even if it is attached to real property. This includes agricultural and industrial products, livestock, food industry items, hunting and fishing products, and electrical energy¹¹.

This legal definition encompasses all tangible and intangible movable items¹², thus extending its application to software, suggesting that product liability might serve as an effective system in the domain of artificial intelligence, particularly for robots. It holds manufacturers accountable for damages caused by their products. For example, if an autonomously driven car is defectively designed or manufactured, posing significant risks, or if a company fails to disclose the associated risks to consumers, product liability principles would apply.

However, applying product liability to robots is fraught with challenges. The inherent risks embedded in the functionality of intelligent robots—specifically their capacity for autonomous action—create unique difficulties. AI systems, and robots in particular, are sources of general risks, necessitating compensation mechanisms for victims of robot-induced harm. Such victims, like any others, have a legitimate right to seek reparations for the damages they suffer.

Although legal provisions allow individuals to seek judicial redress for injuries caused by AI, this method of compensation does not align effectively with the realities presented by the modern industrial age, including damages caused by AI-powered robots. The difficulty in applying product liability to intelligent robots stems from their autonomous and self-learning capabilities, which enable them to make independent decisions. This complexity increases the challenge of proving the existence of defects in robots at the time of production, especially since these defects may not be apparent until after the robots have left the manufacturer or developer's control.

The implementation of product liability in such cases is further complicated by the difficulty in distinguishing between damages arising from the robot's autonomous decisions and those resulting from inherent product defects. Identifying the manufacturer can also be challenging due to the involvement of multiple entities¹³ in the development of robotic software, diminishing the effectiveness of strict liability frameworks in providing adequate consumer protection. Consequently, Article 140 bis 1 of Law No. 05-10 stipulates state responsibility for compensating bodily injuries when no responsible party can be identified, marking a new direction in liability and compensation laws concerning AI-induced injuries.

The issue of compensation for defects in goods, as regulated by the Algerian Civil Code, is addressed within both the general provisions and the specific rules governing sales contracts. The obligation to provide a warranty against defects arises when three fundamental conditions are satisfied:

-Latent Defect: The defect must be hidden and unknown to the buyer. It should not be immediately apparent to an average purchaser and must typically require specific testing or usage to uncover.

-Pre-existing Defect: The defect must have existed in the good prior to the sale or occurred while the item was still under the seller's custody before delivery to the buyer.

-Significant Defect: The defect must substantially impair the value, utility, or intended purpose of the good.¹⁴

In addition to these Civil Code provisions, Algeria's consumer protection law, as a specialized legal framework, governs the relationship between consumers and suppliers in commercial transactions. This legislation establishes detailed requirements to ensure product conformity, mandating that goods meet specified quality and safety standards. It also emphasizes consumer protection against latent defects and irregularities that may compromise product functionality or safety¹⁵.

Similar to Algerian legislation, a segment of legal scholarship advocates for addressing liability for damages caused by robots under the framework of defective product liability. The European Union, in its Directive 85/374 of July 25, 1986, concerning the harmonization of laws, regulations, and administrative provisions among member states, explicitly classifies damages caused by robots as falling within the scope of defective product liability.

This approach is further supported by a report issued by the French Parliamentary Office for Scientific and Technological Assessment on March 15, 2017. The report adopts product liability as the basis for addressing damages arising from artificial intelligence (AI), including robots. It attributes responsibility for compensation either to the designer of the robot's intelligent system or to its manufacturer¹⁶, depending on the source of the defect.

French law aligns with this position through Article 1245 of the French Civil Code, which stipulates that liability for defective robots hinges on demonstrating the existence of a defect or a failure to meet safety and security standards. The defect must be the direct cause of the damage to obligate compensation. Similarly, Article 6 of the European Directive defines a defective product as one that does not provide the safety legitimately expected of it. Article 1386, Paragraph 4 of the French Civil Code echoes this standard, stating: "A product is deemed defective when it does not provide the safety legally expected of it."

From these provisions, it becomes clear that a defect constitutes the primary basis for liability in cases where a robot fails to meet established safety and security standards. This liability extends beyond the functional benefits provided by the robot and emphasizes its compliance with legitimate safety expectations.

The injured party is only required to establish the existence of a defect and the resulting harm. Under such a framework, a product may be presumed defective if it contains a flaw not present in other products of the same serial number. Demonstrating the defect prior to the robot's release into the market is sufficient to establish liability against the designer or manufacturer¹⁷.

In addressing the legal implications of defective product liability when applied to intelligent robots, a multitude of legal hurdles emerges, particularly regarding the evidentiary burden. The inherent complexity of intelligent systems, characterized by continuous learning and ongoing development, significantly complicates the identification and understanding of defects.

Such systems often defy traditional defect localization, making it arduous to ascertain whether the flaw originated during manufacturing or in subsequent development phases involving various stakeholders. This inherent complexity places a disproportionate burden on the injured party, who typically lacks the technical expertise and resources required to identify and prove the existence of a defect.¹⁸

Moreover, the principle of strict liability, which necessitates no fault for liability to be established, presents unique challenges in scenarios involving multiple contributors to a final product. The requirement for all producers to collectively face liability becomes particularly problematic when robots operate on open-source artificial intelligence¹⁹.

Furthermore, proving a robot's defectiveness due to design flaws requires not only a demonstration of safety standard violations but also a delicate balancing of the product's benefits against its risks. This task becomes further complicated when comparing the product with others of similar design—especially within the context of algorithms.

It is worth noting that exemptions from liability are available to manufacturers who can demonstrate that the robot was not in the market at the time of the defect, the defect was not present at the time of distribution, or the defect emerged post-distribution. Furthermore, manufacturers may be exempt if the robot was not intended for commercial distribution or if the state of scientific and technical knowledge at the time of distribution did not allow for the detection of the defect²⁰.

The precautionary principle, widely implemented in consumer protection, environmental regulation, and public health, seeks to mitigate potential risks by addressing them preemptively. However, its application to intelligent robots presents significant challenges. Anticipating and mitigating risks posed by such robots often leads to overcautious regulation, as the principle requires the preemption of risks that are, at present, unverifiable due to the evolving nature of these technologies²¹.

The unique capabilities of intelligent robots further complicate this issue. Their ability to make undefined, unspecified, and unpredictable decisions stems from advanced artificial intelligence systems that enable autonomous learning.

Even the programmers who design the operational frameworks for these systems cannot reliably predict their behavior, as robots possess the ability to make independent decisions without external intervention. This autonomy renders them both independent and, in certain respects, beyond human control.

Moreover, advancements in algorithmic science enable intelligent robots to engage in self-programming. By analyzing and organizing data, they develop operational rules autonomously. Through iterative practice and prolonged experience, these robots refine their programming, acquiring expertise derived from vast amounts of data. Their behavior, therefore, evolves from their own experiences and learning, rather than from predefined programming crafted by human developers.

In light of these complexities, applying strict liability frameworks to intelligent robots in their current operational form presents significant challenges. Determining a defect in scenarios where harm arises from behaviors learned through environmental interaction, as opposed to inherent flaws, proves highly problematic.

Consequently, the difficulty in pinpointing the fault responsible for the damage also complicates identifying the liable party. These challenges highlight the inadequacy of current strict liability models for addressing the risks posed by artificial intelligence and intelligent robots.

Section Two: Civil Liability of Autonomous Robots in Algerian Law

The rapid development of robotics and the increasing autonomy of intelligent robots have exposed the inadequacies of existing legal frameworks in regulating liability for damages caused by robots capable of interacting with their environment and learning from their experiences. This shift necessitates the creation of a new legal status for intelligent robots and the enactment of modern legislation that aligns with technological advancements in artificial intelligence. Such legislation must strike a delicate balance by fostering research, development, and innovation while ensuring compliance with ethical and legal standards in the design, programming, and construction of these robots²².

The European Parliament has made strides in this area by introducing rules governing the use of autonomous robots. These rules stress the importance of maintaining a reasonable degree of human

vigilance and oversight in robotic operations to prevent decision-making authority from entirely shifting away from human control²³.

Similarly, the UNCITRAL Model Law on Electronic Commerce does not explicitly address artificial intelligence systems or electronic agents but provides relevant principles for automated systems. For instance, Article 13 of the Model Law states that, as a general rule, natural or legal persons remain ultimately responsible for actions performed by information systems programmed by or on their behalf to function autonomously, even in the absence of human oversight during the execution of those actions²⁴.

The United Nations Convention on the Use of Electronic Communications in International Contracts echoes this approach in Article 12, which permits the formation of contracts through actions carried out by automated information systems or electronic agents, even without direct human review of these actions.

A- The Legal Status of Smart Robots

The proposition to grant legal personality to intelligent robots poses considerable challenges under the traditional frameworks of legal personality. Granting such status to robots curtails owner liability but deviates significantly from conventional legal norms. Moreover, endowing robots with the same legal personality as natural persons, thereby granting them rights akin to human entitlements such as dignity and citizenship, conflicts directly with fundamental human rights frameworks such as the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights²⁵.

In Algerian legal doctrine, natural persons are bestowed with legal personality from the moment of live birth, enabling them to accrue rights and shoulder obligations, ceasing only upon death, with exceptions made for the absent and missing²⁶ as per Article 29 of the Civil Code and specific provisions in family law regarding inheritance and wills (Articles 128, 134, and 187 of the Family Code²⁷).

Legal personality for natural persons undergoes distinct stages:

-Infancy (Birth to Age 13): A stage characterized by an absence of legal capacity, rendering any contracts or legal acts entered into during this period null and void, with guardians held liable for any legal entanglements²⁸.

-Adolescence (Ages 13 to 18): This stage introduces limited legal capacity, where individuals may engage in legal acts that strictly benefit them. Detrimental actions, however, are considered entirely void²⁹.

-Majority (Age 19 and beyond): Full legal capacity is attained, enabling individuals to independently exercise their civil rights, constrained only by legal incapacities as delineated in Article 42 of the Civil Code. Legal personality ceases upon death, whether actual or presumed³⁰.

These stages reflect the physiological and developmental realities of human beings, which are in stark contrast to the operational and developmental parameters of intelligent robots. Robots are essentially complex digital systems programmed to perform tasks, analyze data, and make decisions based on programmed logic rather than sentient reasoning. Their intelligence, therefore, fundamentally differs from human cognition, which arises from natural mental faculties³¹.

Moreover, imbuing intelligent robots with legal personality akin to that of juridical persons (legal entities) is equally problematic; legal entities operate under the direction and governance of natural persons, a characteristic absent in autonomous intelligent robots³².

Unlike natural persons or traditional legal entities—which are either aggregations of individuals or capital for a common purpose—intelligent robots cannot be encapsulated within these definitions. Legal entities are defined by two primary forms:

-Associations of Persons: These entities consist of groups of individuals united for a common purpose, resulting in a legal personality distinct from its members. Examples include corporations and associations, which function independently of their founders.

-Aggregations of Assets: These entities involve the dedication of assets to achieve charitable or public goals, with the law granting them legal personality. Examples include hospitals and academic institutions³³.

Legal entities are established for lawful purposes, independent of the personal goals of their founders. These purposes must comply with public policy and ethical norms to gain legal recognition.

Article 92 of the Algerian Civil Code outlines the rights conferred upon juridical persons, including the possession of independent financial assets, the capacity to act within the limits prescribed by their constitutive documents or applicable laws, a domicile corresponding to their administrative headquarters, and the right to litigate³⁴. Within this framework, intelligent robots cannot currently be categorized as juridical persons under Algerian law, as they lack the fundamental characteristics defining such entities.

Exceptions to this general principle remain rare and unconventional. One notable example is the 2020 decision by Saudi Arabia to grant citizenship to the humanoid robot Sophia, an extraordinary case that deviates from established legal norms. Additionally, juridical persons under Algerian law can be held both criminally and civilly liable for actions committed by their representatives or members.

Penalties, such as fines, closures, or asset confiscations, are tailored to their nature³⁵. In contrast, intelligent robots, being autonomous systems without human representation, cannot be held criminally or civilly liable. Reflecting this limitation, the European Parliament, in its recommendations on civil law rules for robotics issued on February 16, 2017, explicitly declared that robots cannot themselves be held accountable for actions causing harm to third parties.³⁶

In comparing intelligent robots and juridical persons. The latter are granted legal personality to fulfill specific purposes, typically involving collectives of individuals or aggregations of assets. Their creation, management, and accountability are intrinsically linked to human representation. In contrast, intelligent robots lack these essential characteristics. They are not human-governed entities but autonomous systems operating independently of the traditional structures required for juridical persons.

In light of these differences, the European Parliament proposed an alternative regulatory concept—the assignment of "electronic personality" to intelligent robots. This framework includes providing robots with unique identifiers, such as serial numbers or identification codes, and equipping them with a "black box" to record operational data³⁷. While this approach aligns with the operational attributes of robots, it does not equate them with juridical persons, as they lack independent financial resources and are not governed by human representatives.

B- Civil Liability Challenges Regarding The Legal Personality of Autonomous Robots

The conferral of legal personality upon intelligent robots does not inherently bestow them with comprehensive human rights. Rather, it primarily facilitates the attribution of responsibility for damages incurred, particularly as the development of intelligent robots typically involves multiple actors—manufacturers, programmers, and end-users. When damages occur, the victim must navigate a complex landscape to identify the liable entity.

Assigning legal personality to intelligent robots could subject them to legal accountability, enhancing the legal framework's capability to address the challenges posed by artificial intelligence. This adaptation would refine the legal system's response to technological advancements, allowing for more effective interaction between humans and robotic entities.

Thus, the recognition of legal personality in artificial intelligence aims to pinpoint the responsible party for damages caused by intelligent robots, imposing obligations directly upon these entities, thereby safeguarding other legal persons. However, this approach encounters significant hurdles due to robots' lack of independent financial resources necessary for liability purposes³⁸.

In response, the European Parliament has recommended the creation of an insurance fund financed by various stakeholders, especially manufacturers, to compensate for damages caused by robots³⁹.

Granting legal personality to artificial intelligence, particularly advanced autonomous robots, raises profound legal and ethical questions. While such recognition might shield manufacturers and other stakeholders from liability, it also underscores the inadequacy of traditional legal frameworks to address the complexities introduced by intelligent systems. Proposals have emerged to create an electronic legal personality tailored to robots that exhibit significant autonomy. This approach aims to dissociate the causal relationship between a robot's independent actions and its manufacturing or operational oversight⁴⁰.

This proposal has garnered considerable criticism among legal scholars. Critics caution against the establishment of a distinct legal category for robots, arguing that it risks creating a parallel societal construct detached from human accountability. Furthermore, proponents of human responsibility assert that technological advancements, regardless of their sophistication, are ultimately a product of human ingenuity. Consequently, liability for damages caused by robots should remain with the individuals or entities responsible for their design, programming, and deployment⁴¹.

Nevertheless, in Western and European legal discourse, the debate surrounding the recognition of robots as legal entities has gained prominence. Proposals such as the European Civil Code for Human-Machine Interaction⁴² explore the potential for robots to bear legal responsibility for their actions; the role of legal scholarship in refining the scope and implications of such recognition is indispensable.

Despite the extensive emphasis on granting legal personality to intelligent robots as a means of assigning liability, it is essential to acknowledge that legal personality and legal responsibility, while interconnected, remain distinct concepts. Legal personality is not synonymous with legal responsibility; the former exists independently of the latter. However, the reverse is not true—legal responsibility invariably presupposes the existence of legal personality.

Not all entities endowed with legal personality are subject to legal responsibility for their actions. For instance, individuals who lack cognitive capacity retain legal personality but are exempt from civil liability. Conversely, individuals with full cognitive and legal capacity possess both legal personality and legal responsibility. This dual capacity qualifies them as legal agents, rendering them accountable for their actions within the legal framework.

When an individual loses the mental awareness necessary to comprehend the implications of their actions, they are no longer deemed legally accountable. This, however, does not negate the rights of victims to seek compensation. In such instances, responsibility transfers to the guardian or representative of the incapacitated individual, who bears the obligation to compensate for damages caused by the latter's actions⁴³.

It is theoretically conceivable to question whether an intelligent robot could be held accountable for deliberate actions, framing such conduct as intentional fault. However, a more

complex question arises: could a robot also be held liable for unintentional actions, such as those resulting from forgetfulness or a lack of caution? This line of inquiry invites a fundamental consideration: can a machine exhibit traits like forgetfulness or oversight?

At present, intelligent robots are incapable of experiencing forgetfulness or engaging in negligence in the human sense. Consequently, traditional legal frameworks predicated on the dichotomy between intentional and unintentional fault struggle to apply to artificial intelligence. The concept of intentional fault, in particular, remains elusive when applied to intelligent robots, as they lack cognitive awareness of the implications of their actions. They operate exclusively within the confines of preprogrammed linguistic and neural algorithms, devoid of the ability to evaluate legality or morality.

Both intentional and unintentional fault are rooted in intrinsically human characteristics, such as volition and memory, which are fundamentally tied to human cognition and emotional awareness. To date, artificial intelligence has not succeeded in replicating these human traits, and it remains improbable that it will achieve this capability in the foreseeable future.

Conclusion:

Artificial intelligence has now firmly established itself as a real and force in the simulation of the human world, sparking a comprehensive revolution, particularly in security and legal domains. This evolution demands the adoption of legal solutions responsive to the escalating challenges posed by the autonomy of artificial intelligence.

Given the exponential growth and complexity of AI technologies, ranging from conventional robots to advanced intelligent robots with decision-making autonomy and the ability to emulate human intelligence, there is a crucial need for objective evaluation and robust frameworks to manage these technologies' implications.

Although intelligent robots significantly enhance efficiency, accuracy, and productivity across various sectors, they are not devoid of drawbacks. AI developers face significant challenges in crafting sophisticated and reliable software to prevent errors that may cause harm to individuals, potentially leading to civil liability. These issues have sparked intense legal debate regarding whether existing civil liability norms under the Algerian Civil Code suffice, or whether new legal statutes specifically tailored to artificial intelligence and autonomous robots are necessary. The consensus among legal experts suggests that the current Algerian legislative framework is inadequate for addressing civil liability in the context of artificial intelligence.

At the end of this study we can say as conclusion that de intelligent robot has not an unified definition, and almost legal scholars have focused about the technical aspects and connected it to the humans due to because the nature of these systems. Furthermore, the recognition of the intelligent robot legal personality could allow the users and manufacturers to avoid their responsibilities harming victims who would be left without a legal framework to secure their rights..

In response to these challenges, the following recommendations are proposed:

- It is imperative for legislators to keep pace with technological evolution by establishing a legislative framework that clarifies the legal nature and status of artificial intelligence, particularly concerning intelligent robots. This framework should resolve existing legal issues and preempt future challenges.
- Strengthening technical security and protecting data privacy in AI applications are essential. This goal could be achieved through the enactment of specialized cybersecurity legislation, considering that any misuse of data poses significant risks to individual rights.

- Establishing ethical and regulatory frameworks to govern artificial intelligence operations is crucial. Such mechanisms should include a legislative system that regulates interactions between humans and machines in an era where intelligent robots may surpass human capabilities.
- Universities and research centers should lead in addressing issues related to AI and robotics by promoting scientific and legal research aimed at developing and regulating artificial intelligence applications.
- Legal protections that encourage innovation should be expanded to include artificial intelligence technologies within existing intellectual property laws. This approach would ensure that AI advancements are safeguarded under patent law and other intellectual property protections.

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