

International and Comparative Corporate Law Journal

ISSN: 1388-7084 & E-ISSN: 1875-8290

Civil Liability for Damages Caused by Artificial Intelligence: A Comparative Legal Analysis

Larguet Farida¹ & Larguet Aziza²

¹Holds a Doctorate in Contracts and Liability, University of Batna 1

²Lecturer "A", University of Oum El Bouaghi

Email: larguetfarida593@gmail.com; farida.larguet@univ-batna.dz;

aziza.larguet@univ-ueb.dz

Received: 22/10/2025 **Accepted:** 17/02/2026 **Published:** 15/05/2026

Abstract

Today, the world is witnessing an unprecedented technological leap, one of its most prominent manifestations being artificial intelligence technologies, which have become an indispensable necessity. They have imposed themselves as a fundamental tool for keeping pace with global development and benefiting from their capabilities in various fields; otherwise, we may face falling behind developed countries.

It is undeniable how much artificial intelligence affects different areas of life, whether cultural, social, economic, military, or scientific, as these systems are able to perform tasks that sometimes exceed human mental capacity, starting from facilitating global communication, passing through completing digital and computational tasks, and reaching active contribution in the industrial sector in all its forms.

Despite the great benefits it provides, the widespread use of these technologies may result in serious damages, which raises the need to study the civil liability arising from them.

This research aims to provide a comprehensive definition of artificial intelligence, explain its characteristics, and address the patterns of civil liability related to damages resulting from its use.

Keywords: artificial intelligence, legal personality, civil liability, human proxy.

Introduction

Artificial intelligence has witnessed tremendous development in recent times and continues to progress at a rapid pace, becoming one of the active elements in various fields of social,

economic, and technological life. Artificial intelligence has entered advanced domains, including medical, legal, military fields, and transportation, where self-driving cars have become more widespread, and robots such as the Da Vinci robot have entered precise and complex surgical operations.

Artificial intelligence is defined as an intelligent software system that may take a physical form, such as robots and self-driving cars, or a non-physical form, such as computer programs. It aims to enable machines to perform tasks similar to human tasks, including decision-making, problem-solving, learning from past experiences, collecting and analyzing data and information, speech recognition, and language translation.

As a result of these capabilities, artificial intelligence has become able to simulate human behavior and perform functions that were previously monopolized by humans. However, despite the significant benefits these technologies bring to society, they may also cause harm to others that is difficult to address under traditional civil liability rules, due to their ability to make independent decisions without returning to their owner, or to execute commands contrary to those given to them, making them a potential source of public risk.

Due to the technical complexity of these systems, it becomes difficult to determine whether the harm is caused by behavior learned by the system from its environment, a manufacturing defect, or the instructions given to it. This raises the question of recognizing legal personality for artificial intelligence, not to grant it full human rights, but to determine civil liability and identify the responsible person or entity for the resulting damage.

This raises the following research question: *To what extent can traditional civil liability rules address damages caused by artificial intelligence, and does reality impose the recognition of legal personality for artificial intelligence in order to identify the actual liable party and hold it accountable for damages?*

Chapter One: The Nature of Artificial Intelligence

Artificial intelligence is a software system capable of simulating human behavior and making independent decisions through learning, information analysis, and problem-solving. With its expansion in various fields such as medicine, law, and transportation, potential harm to others has emerged due to its actions or technical errors.

This chapter is divided into two sections:

- **Section One: The Concept of Artificial Intelligence Technologies**
- **Section Two: The Nature of Civil Liability for Damages Caused by Artificial Intelligence Systems**

Section One: The Concept of Artificial Intelligence Technologies

Artificial intelligence is one of the modern concepts that raises many legal and scientific questions, particularly regarding the ability of technical systems to simulate human behavior in terms of thinking, perception, analysis, and interaction with the surrounding environment. These technologies are characterized by distinctive features that make them increasingly important in various fields.

This section is divided into two subsections:

- **Subsection One: Definition of Artificial Intelligence Technologies**
- **Subsection Two: Characteristics of Artificial Intelligence Technologies**

Subsection One: Definition of Artificial Intelligence Technologies

It is not possible to define artificial intelligence without first addressing the concept of “technology,” which refers to the set of tools and knowledge used by humans to exploit natural resources and transform them according to various needs. Technology is also defined as the practical application of knowledge and includes various fields such as industry, health, food, and others.

Artificial intelligence is a branch of computer science concerned with developing systems capable of simulating intelligent human behavior through algorithms, machine learning, and big data analysis, enabling learning, inference, understanding, and decision-making.

Its definitions vary among scholars. Some define it as a simulation of human intelligence through designing computer programs capable of imitating intelligent human behavior. It is now present in many fields such as autonomous vehicles, drones, translation systems, and investment applications.

John McCarthy defined it as: “a way to make a computer or robot controlled by a computer think intelligently in the same way that intelligent humans think. Artificial intelligence is achieved by studying how the human brain thinks, how humans learn, decide, and teach while solving problems, and then using these results as a basis for developing intelligent systems.”

It has also been defined as: “a field of computer science aimed at creating new capabilities for computer systems that simulate human mental processes such as learning, planning, inference, and decision-making using appropriate algorithms.”

Another definition describes it as: “a set of efforts aimed at developing information systems capable of understanding natural language, performing tasks, storing human knowledge, and using it in decision-making processes.”

Subsection Two: Characteristics of Artificial Intelligence Technologies

Artificial intelligence technologies are characterized by features that distinguish them from traditional systems, as they simulate human mental capabilities such as thinking, perception, analysis, imagination, and creativity. They can also process sensory inputs such as sound and images and utilize data effectively.

These characteristics include:

First: Knowledge Representation

AI systems organize information into structured knowledge bases composed of facts, relationships, and logical rules, which serve as the foundation for problem-solving and decision-making.

Second: Heuristic (Non-linear) Search

AI does not follow a fixed sequential method but selects optimal solutions depending on the problem, with the ability to adapt strategies when necessary.

Third: Handling Incomplete Information

AI can operate with incomplete or uncertain data and still produce usable results based on available inputs.

Fourth: Learning Ability

AI systems improve their performance over time by learning from data and experience, especially through machine learning techniques.

Fifth: Reasoning Ability

AI can derive new conclusions from existing knowledge using logical reasoning methods such as deduction and induction.

Section Two: The Nature of Civil Liability for Damages Caused by Artificial Intelligence Systems

The nature of civil liability arising from AI-related damages depends on the legal framework governing its use. Contractual liability may arise when damage results from breach of contractual obligations involving AI systems, while tort liability arises when damage results from violation of a general legal duty.

Doctrine distinguishes between two main approaches: the traditional theory and the modern theory.

Under the traditional theory, AI systems are considered “things,” and liability is governed by the rules of liability for things, where the custodian or owner is presumed at fault due to control and supervision obligations.

However, this approach is insufficient for modern autonomous systems capable of self-learning and independent decision-making, which may deviate from programmed instructions and cause unexpected harm.

This has led modern doctrine, particularly in Europe, to adopt the concept of the “**human proxy**”, attributing liability to persons involved in designing, developing, operating, or exploiting AI systems according to their contribution to the damage.

Accordingly, contractual liability may arise if AI use leads to breach of contractual obligations, provided fault, damage, and causation are proven. Tort liability may also arise when AI causes harm through breach of a legal duty, where fault may stem from defective design, programming errors, lack of supervision, or misuse.

The complexity and autonomy of AI systems therefore require rethinking traditional civil liability rules to ensure a balance between innovation and protection of victims.

Section Three: Application of Legal Personality to Artificial Intelligence Technologies

Subsection One: Recognition of Legal Personality for Artificial Intelligence Applications

The question of granting legal personality to AI applications, especially robots, is crucial in determining the applicable legal regime in cases of damage. Legal personality is traditionally granted to humans from birth to death, making human nature the basis of legal subjectivity.

However, this criterion is increasingly debated due to difficulties in defining human essence and decision-making autonomy. This has led some scholars to compare human traits with AI systems and propose expanding legal personality to include non-human entities such as animals and robots, as forms of artificial intelligence applications.

Subsection One: Recognition of Legal Personality for Artificial Intelligence Applications

Recognizing legal personality for robots entails determining the legal rules applicable to liability for their actions. A trend has emerged in French positive law toward considering the robot as an independent legal entity, based on the assumption that it possesses rights and obligations. Supporters of this approach rely on the precedent of legal systems recognizing legal personality for non-human entities, which justifies analogy in this regard.

This approach also relies on the idea of “legal fiction” as the basis for granting legal personality, considering that this conception is supported by general legal principles and is capable of

application. This argument is reinforced by the European Parliament's call for future recognition of what is known as the "electronic person," whereby autonomous robots would bear liability for compensation for damages caused to others.

Accordingly, recognizing legal personality for robots leads to shifting from the idea of liability for the acts of robots to the idea of the robot's own liability, which requires granting it an independent financial patrimony, subjecting it to a special registration system, and allowing insurance coverage for damages it may cause.

Part of legal doctrine also considers it necessary to grant artificial intelligence applications legal personality exclusively in the form of legal persons, on the basis that this personality is one of the creations of modern legal systems, which established rules distinct from those governing natural persons until it became an established reality in contemporary legal systems. Supporters of this view argue for granting intelligent robots legal personality similar to corporations, such that they acquire this status after registration in a special register established by the state for this purpose, containing all data related to the robot, such as its financial status, capabilities, and nature of activity, allowing third parties to review this information before dealing with it.

However, this conception has not escaped criticism, since the traditional legal person is managed by humans, whereas the intelligent robot possesses a degree of independence in decision-making, which raises a distinct legal problem concerning the nature of such entities.

Although most legislations currently do not recognize legal personality for artificial intelligence, the rapid development of these technologies may in the future lead to reconsideration of this position.

Referring to the evolution of the concept of legal persons, it can be said that legal systems may move toward recognizing a form of legal personality for intelligent robots similar to that applicable to corporations, especially in advanced applications such as self-driving cars, intelligent medical devices, and industrial robots.

Subsection Two: Non-recognition of Legal Personality for Artificial Intelligence Applications

Civil law in most countries recognizes only two types of legal personality: natural legal personality, which belongs to human beings, and juridical or moral legal personality, granted to legal entities according to conditions established by law.

However, artificial intelligence technologies, or what are referred to as virtual persons, cannot be classified as natural persons because the latter category is limited exclusively to humans. Nor can they be assimilated to legal persons due to the difference in legal nature between them.

Therefore, traditional legal rules are incapable of accommodating these newly emerging entities, particularly intelligent ones, since they constitute a modern phenomenon unknown to legislators and most jurists until now.

Moreover, granting legal personality to artificial intelligence would require recognizing a set of rights usually granted to legal persons, such as legal capacity, citizenship, work, marriage, financial patrimony, and others, which raises practical and legal problems due to the difficulty of attributing such rights to non-human entities. In addition, there are difficulties relating to the possibility of establishing civil or criminal liability against artificial intelligence independently, without referring to the responsibility of the operator or designer.

These problems largely stem from the fact that most legislations do not recognize legal personality for artificial intelligence. In this context, supporters of the rejecting approach argue that there is no legal justification for granting these technologies legal personality, especially in the field of intellectual property, since artificial intelligence cannot enjoy the rights arising therefrom. Such rights presuppose awareness and understanding in order to bear their legal consequences, which is limited to humans alone. Furthermore, these rights are granted to those capable of benefiting from them, which does not apply to artificial intelligence as it is merely a machine.

In addition, part of legal doctrine considers that patent registration rules require the invention to be attributed to a natural person, which prevents attributing the status of inventor to artificial intelligence or granting creative work status to its outputs. Consequently, these outputs do not enjoy the legal protection granted to creative works, since artificial intelligence is merely a tool lacking awareness and perception.

The concept of legal personality was originally created to regulate human relations, which raises the question of the extent to which it can be applied to artificial intelligence technologies such as robots.

Some jurists also argue that granting legal personality to these technologies may become a means for manufacturers and developers to evade liability for damages caused by them.

Chapter Two: Doctrinal Trends in Determining Civil Liability Arising from Artificial Intelligence Errors

In light of the rapid development of artificial intelligence technologies and society's increasing reliance on them in various areas of life, the need has emerged to determine civil liability for damages resulting from errors committed by these systems. Legal doctrine has devoted considerable attention to this issue, giving rise to multiple doctrinal approaches differing in the

manner of assigning liability. Some argue for attributing liability to the human operator or developer, while others propose new mechanisms related to the virtual legal personality of artificial intelligence, reaching approaches based on the theory of the human proxy. All these trends aim to achieve a balance between the protection of rights and the encouragement of technological innovation.

This chapter addresses:

- **Section One: Determining Liability in Light of Traditional Theories**
- **Section Two: Modern Doctrinal Trends in Determining Liability**

Section One: Determining Liability in Light of Traditional Theories

Determining the standards of civil liability for damages resulting from artificial intelligence technologies is an issue of great importance, whether concerning contractual liability or tort liability, given the damages these technologies may inflict on individuals' interests.

This section is divided into two subsections:

- **Subsection One: Contractual Liability of the Human Proxy for the Acts of Artificial Intelligence Devices**
- **Subsection Two: Tort Liability for Damages Caused by Artificial Intelligence Devices**

Subsection One: Contractual Liability of the Human Proxy for the Acts of Artificial Intelligence Devices

Contractual liability arises whenever there is a valid contract between parties under which each party is obligated to perform its obligations according to the agreement. If one party breaches its obligation, whether through non-performance, defective performance, or delayed performance, contractual liability arises. Such breach entitles the other party to refrain from performing its corresponding obligation, in addition to claiming compensation for damages suffered, whether such compensation was predetermined contractually or assessed judicially according to the actual loss and lost profit suffered by the injured party.

In this regard, contracts relating to robots or intelligent systems are generally bilateral binding contracts, whereby the human proxy—as representative or operator of these systems—undertakes contractual obligations, foremost among them providing an artificial intelligence system conforming to agreed specifications and conditions. If the system is proven not to conform to those specifications, the purchaser has the right to terminate the contract and claim

compensation. Contractual liability in this case arises merely from breach of the obligation, even if no actual damage occurs, whenever the obligation is one requiring a specific result.

On the other hand, the client is obliged to pay the price and use the system according to prescribed instructions and standards, making the relationship between the parties similar to a sale or supply contract for a product or service, while taking into account safety requirements and consumer protection.

Although certain operations may be carried out automatically by intelligent systems without direct human intervention, contractual liability cannot be attributed to these systems themselves due to their lack of legal personality under traditional rules. Accordingly, liability remains attached to the human proxy as the person exercising actual control over the system and benefiting from its results, so long as the contract was concluded in his name or for his account. The forms of intelligent systems capable of contracting on behalf of human users vary. They may consist of software or electronic agents operating عبر the Internet, or physical robots capable of interaction, negotiation, and concluding transactions. Nevertheless, these systems remain merely execution tools, such that the user is considered the human proxy bearing liability, while the systems themselves constitute only electronic proxies carrying out transactions.

On this basis, contractual liability for damages caused by artificial intelligence requires the general elements of liability to be established, namely contractual fault, damage, and the causal link between them, where the breach of obligation results from manufacturing defects, operational malfunctions, or failure to take necessary precautions to avoid foreseeable risks.

Subsection Two: Tort Liability for Damages Caused by Artificial Intelligence Devices

Tort liability constitutes a legal consequence resulting from the breach of a general legal obligation imposed on individuals not to cause harm to others, whether such breach is material or moral in nature. For this liability to arise, three essential elements must be established: fault, damage, and the causal relationship between them. Compensation cannot be awarded to the injured party unless all these elements are proven together.

In the context of artificial intelligence devices, damages resulting from them may fall under tort liability rules whenever its elements are fulfilled. Such liability arises only if the damage is the direct result of fault attributable to a natural or legal person who breached a legal duty not to harm others, which requires proving that this fault caused the damage.

A practical example is when a physician relies on a medical robot or an AI-supported clinical decision system to determine appropriate treatment. If the system issues an incorrect

recommendation that the physician could easily have detected and avoided its consequences, but negligently failed to do so, tort liability arises against the physician for the harm suffered by the patient, not for the recommendation itself issued by the system.

The general principle is that a person is liable only for his own acts, and liability for the acts of others remains exceptional. Civil liability requires fault, damage, and causation, and the burden of proving these elements falls upon the injured party, as the claimant seeking compensation for the damage suffered.

Section Two: Modern Doctrinal Trends in Determining Liability

In light of the criticisms directed at traditional theories and their insufficiency in determining civil liability resulting from errors that may arise from artificial intelligence applications, some jurists have turned toward adopting modern theories to determine liability. One group of scholars adopted the theory of objective liability as the basis for determining liability, while another focused on the concept of the human proxy to clarify the legal frameworks of liability. To present these theories in an organized manner, this section addresses:

- **Subsection One: Objective Liability**
- **Subsection Two: The Theory of the Human Proxy**

Subsection One: Objective Liability

European Directive No. 85/374/EC establishes producer liability on the basis of liability without fault in the event of damage resulting from a defective product. If more than one party, such as the manufacturer, supplier, or importer, is responsible for the same damage, joint liability applies among them. European Union law also contains provisions governing non-contractual liability, as it provides European states with an integrated framework for claiming compensation for damages arising from products. The Directive does not require that the claim be based on proving fault on the part of the manufacturer, as the drafters of the Directive affirm that the applicable system is objective liability. However, liability does not arise merely because the product causes harm to others; rather, it is required that the product be defective and that the defect be the direct cause of the damage for which compensation is sought.

According to paragraph six of the European Directive, a defective product is defined as a product that lacks the level of safety legitimately expected from it. This was adopted by the French legislator in Article 1386/4 of the French Civil Code, which provides that: “A product is considered defective in the eyes of the law if it does not provide the level of safety legally expected from it.” The defect constitutes the basis of liability where safety and security

standards are absent from the product. The matter is not limited to the expected utility of the product, and the injured party is only required to prove the damage and the existence of the defect. This justifies the European Directive's adoption of liability without the need to prove fault. Article One of the Directive establishes the basic principle that the producer is liable for damages caused by defective products, reflecting the European system's focus on objective liability associated with the defect, without regard to wrongful conduct on the part of the producer.

It is thus clear that European provisions establish producer liability on the basis of risk, which has also been adopted by French courts in their rulings based on the European Directive, confirming the objective nature of liability.

In cases where multiple persons contribute to producing a product before it reaches the final consumer, French law and the European Directive establish joint liability of producers toward the injured party. However, determining the liable person becomes extremely complex if the operating software of the AI-based robot is open source. Therefore, objective liability applies to any product except in cases where the expert system is classified as a service. Conversely, if the system is limited to providing routine data analyses, the software is considered a product, and liability is based on the theory of risk.

It should be noted that applying producer liability to artificial intelligence products faces significant challenges due to the nature of these systems, which fall within what is called inherent functional risks, making artificial intelligence a source of general risks. The difficulty in applying objective liability to these systems lies in the fact that they are self-learning systems capable of making independent decisions, which makes it difficult for the claimant to prove the existence of defects in AI products, especially when such defects did not exist at the time the product left the manufacturer or developer.

It is difficult to draw a clear line between damages resulting from the autonomous decisions of artificial intelligence and damages related to a defective product. Moreover, identifying the manufacturing or developing company constitutes an additional problem due to the multiplicity of parties participating in the development of the system.

On the other hand, the use of traditional liability rules does not appear suitable for complex algorithms, noting that the producer may be exempted from liability according to the general rules of civil law if it proves that the damage resulted from an external cause beyond its control. Based on the foregoing, it is evident that applying objective liability to artificial intelligence faces major difficulties, as it is difficult to determine the existence of a product defect when damage results from behavior acquired from the robot's surrounding environment. Therefore,

it is necessary to reconsider product liability rules so that they align with the specific nature of artificial intelligence. Furthermore, adopting objective liability on the basis that activities related to artificial intelligence are hazardous activities requires identifying the person responsible for such activity, which makes the current application of objective liability unsuitable for addressing damages arising from artificial intelligence.

Subsection Two: The Theory of the Human Proxy

The European Parliament developed the theory of the Responsible Human Agent within the rules of European civil law relating to robotics issued in February 2017, with the aim of assigning liability for the operation of robots to a group of persons according to the extent of their fault in manufacturing or exploiting the robot and the extent of their negligence in preventing foreseeable acts by the robot, without presuming fault or considering the robot an independent thing.

In this context, the European Union relied on the concept of the “human proxy” to ensure the existence of a person responsible for the acts of the automated robot. European robotics law provides that, due to the impossibility of establishing direct liability against the robot for damages it may cause to others, liability for the robot’s acts and omissions falls upon the human proxy. French doctrine refers to this person as the “robot counterpart.” The proxy may be the manufacturer, operator, owner, or user of the robot, and bears the obligation to compensate for damage resulting from the operation of the robot on the basis of fault.

The European legislator deliberately used the term “proxy” rather than “guardian” or “supervisor” to emphasize that the idea of the human proxy does not correspond to the theory of custody of mechanical things or things requiring special care. Furthermore, European law did not grant the robot any legal capacity, as it did not use the term “guardian” or “trustee,” since legal capacity is granted to legally recognized persons, while the legislation merely granted the robot a potential future legal status.

Accordingly, it can be said that European civil law relating to robotics adopted an innovative legal situation based on the theory of representation in liability, whereby responsibility for the acts of the robot is transferred to the human proxy representing the robot, who bears compensation for damages resulting from operational errors. Civil liability here is based on the elements of fault, damage, and causal relationship, whether the fault arises from manufacturing, operation, or use, with application of the principle of proportionality between fault and damage. European civil law also provides for the liability of the proxy in the event of breach of the duty to manage risk, that is, if the proxy fails to seek to prevent a foreseeable accident resulting from

an act or omission of the robot during its operation. The basis of the human proxy's liability lies in fault in manufacturing or managing the robot, leading to deviation in its performance during operation, whereas a robot that has ceased movement is classified as a thing rather than an intelligent machine.

Conclusion

The rapid development of artificial intelligence technologies and the radical transformations they have produced in various aspects of life have cast their shadow over the traditional structure of civil liability rules, revealing the limitations of these rules in accommodating the emerging dimensions of damages caused by intelligent systems. Artificial intelligence, with its relative autonomy, self-learning capability, and decision-making without direct human intervention, has become a precise legal problem concerning the determination of the basis of liability and the identification of the person responsible for the damage.

This study has reached the following findings:

Findings

- Artificial intelligence represents a technological model different from traditional means, due to its characteristics of autonomy and complexity, which makes subjecting it to general civil liability rules insufficient.
- The inadequacy of the fault theory as the sole basis for liability has become evident due to the practical difficulties associated with proving fault in intelligent systems based on self-learning.
- There exists a doctrinal divergence between a traditional approach emphasizing personal human liability and a modern approach advocating objective liability or the creation of a special legal regime.
- The theory of risk-bearing has emerged as one of the most suitable foundations for addressing artificial intelligence risks, due to its connection with the concept of emerging risks.

Recommendations

The necessity of legislative intervention to establish a special and integrated legal framework regulating civil liability for damages caused by artificial intelligence, taking into account its complex technical nature.

- Adoption of an objective liability system in fields characterized by high risks or difficulty in proving fault, thereby ensuring effective protection for injured parties.
- Establishment of precise legal mechanisms for distributing liability among the different parties involved according to the criterion of control or degree of contribution to causing the damage.
- Adoption of a mandatory insurance system to cover damages arising from the use of intelligent systems, ensuring prompt and stable compensation.
- Studying the possibility of granting certain artificial intelligence applications a special legal status, without recognizing full legal personality, thereby allowing the attribution of certain obligations directly to them.
- Strengthening international efforts aimed at unifying the legal rules governing such liability due to the cross-border nature of these technologies.
- Encouraging multidisciplinary scientific research, especially at the intersection of law and technology, contributing to the development of innovative and sustainable legal solutions.

References

Books

- Ahmed Lotfy, K. H. (2021). *Artificial intelligence and its civil and criminal protection*. Alexandria: Dar Al-Fikr Al-Jami'i.
- Ibrahim, K. M. (2021). *The legal regulation of artificial intelligence* (1st ed.). Alexandria: Dar Al-Fikr Al-Jami'i.
- Abd Al-Salam, S. S. (1998). *The problem of compensation for technological environmental damages* (1st ed.). Cairo: Dar Al-Nahda Al-Arabiya.
- Abd Al-Nour, A. (2005). *Introduction to the world of artificial intelligence*. Saudi Arabia: King Abdulaziz City for Science and Technology.
- Al-Bakri, A. A., & Al-Bashir, Z. (2015). *Introduction to the study of law*. Lebanon.
- Haidawi, A. A. (2021). *The unfair clause in contracts: A comparative study*. Cairo: Modern Institution of Books.
- Saleh, I. (2021). *Artificial intelligence in internet business*. Egypt: Dar Al-Jami'a Al-Jadida.
- Lanjar, F. J. (2010). *Management information systems: An administrative perspective* (3rd ed.). Amman: Dar Hamed for Publishing and Distribution.
- Abd Al-Zaher, M. (2018). *Artificial intelligence journalism: The fourth industrial revolution and the restructuring of media*. Cairo: Dar Badael for Publishing and Distribution.

Mouawad, N. (2015). *Liability of aircraft manufacturers* (2nd ed.). Cairo: Dar Al-Nahda Al-Arabiya.

Journals

Majed, A. (2018). Artificial intelligence in the United Arab Emirates. *Department of Economic Studies and Policies, Ministry of Economy, Abu Dhabi.*

Al-Khatib, A. A. Legal status of the personal human being and liability: A comparative foundational study. *Kuwait International Law School Journal*, 6(4), Serial No. 24.

Sultani, A., & Zaabin, A. (2020). Assessment of the legal risks of artificial intelligence in managing the COVID-19 pandemic crisis. *Al-Haqiqa Journal for Social and Human Sciences*, 19(3).

Sayed, A. M. (2020). Protection and proof of legal transactions through artificial intelligence applications. *Arab Researcher Journal*, 1, Beirut.

Al-Dhaheri, S. K. (2017). Artificial intelligence as the new competitive force. *Future Foresight and Decision Support Center*, Issue 299, Dubai.

Bouchareb, S., & Klou, H. (2022). The legal status of robots in light of civil liability rules. *Journal of Judicial Ijtihad*, 14. University of Biskra.

Al-Dahiyat, I. A. R. (2019). Towards a legal regulation of artificial intelligence in our lives: The problem of the relationship between humans and machines. *Journal of Legal and Economic Studies*, 8(5).

Hassanein, M. I. I. (2023). Smart applications and civil liability for damages resulting from their application. *Legal Journal, Faculty of Law, Khartoum Branch*, 15(1).

Hassanein, M. I. I. (2023). Artificial intelligence and civil liability for damages resulting from its application. *Legal Journal, Faculty of Law, Khartoum Branch*, 15(1).

Al-Ma'dawi, M. A. Civil liability for robots. *Legal Journal*, Egypt.

Mahmoud, M. S. (2023). The role of smart devices in developing civil liability rules. *Journal of the College of Law for Legal and Political Sciences*, 11(43). Kirkuk University.

Al-Musa'ada, N. A. (2005). Elements of harmful electronic acts in Jordanian law. *Dirasat Journal, Sharia and Law Sciences*, 32(1). University of Jordan.

Fetima, N. (2020). Legal personality of the new being: The virtual person and the robot. *Professor Researcher Journal for Legal and Political Studies*, 5(1).

Al-Qousi, H. (2018). The problem of the person responsible for operating the robot and the impact of the human proxy theory on future legal groups: An analytical and prospective study in European civil law rules related to robots. *Generation Journal of Legal Research*, 25.

Al-Qousi, H. (2020). Civil liability for damages caused by artificial intelligence. *Generation Journal for Advanced Legal Research*, 5(43).

Master's Theses and Doctoral Dissertations

Saeb, R. M. (2022). *Administrative applications of artificial intelligence* (Master's thesis). Middle East University, Jordan.

Al-Raoud, T. H. A. (2022). *Civil liability for damages caused by operators of artificial intelligence technology* (Doctoral dissertation). Faculty of Law, Mansoura University.

Abdul Majid, Q. M. (2009). *Use of artificial intelligence in electrical engineering applications: A comparative study* (Master's thesis). Arab Academy, Denmark.

Khamis, N. A. (2020). *Civil liability for damages caused by robots* (Master's thesis). United Arab Emirates University.

Internet Sources

Wikipedia. Retrieved from Wikipedia

European Parliament Study. Retrieved from European Parliament Study

European Parliament Resolution. Retrieved from European Parliament Resolution on Robotics

HAL Archives. Retrieved from HAL Archives