CIVIL LIABILITY FOR THE USE OF THE ARTIFICIAL INTELLIGENCE SYSTEM

SAMIRA ABED[1]

[1]Faculty of Law, Badji Mokhtar University of Annaba (Algeria)

The E-mail Author: samira.abed@univ-annaba.dz

Received: 16/09/2024 **Published: 20/04/2025**

Abstract:

Due to the technological advancements that the world experiences daily through various innovations, including artificial intelligence systems, these technologies have come to play an important role in the tasks they perform. However, this does not imply that they cannot cause harm to others, raising the issue of who is responsible for compensation and the appropriateness of tort rules concerning artificial intelligence.

Tort rules cannot be applied to artificial intelligence, nor can we apply certain elements of liability rules related to personal acts and liability concerning objects. However, we can apply the rules of objective liability to provide compensation for damages by establishing regulations that specify the responsibilities of the producer, the programmer, and the user.

***Keywords**: civil liability, artificial intelligence, tort liability, legal personality.*

1. INTRODUCTION:

In the light of the technological advances witnessed worldwide, which have produced several generations of modern technologies and systems, what is known as Artificial Intelligence has emerged. This represents a qualitative leap in the traditional view of machines and modern technologies, transforming them from static inventions with explicit and direct instructions into systems with immense capabilities and characteristics that mimic human behaviour.

While Artificial Intelligence has provided many services and benefits that make human life easier by performing tasks and functions that exceed human intelligence, it is not without risks. AI has the potential to cause significant harm to others, sometimes resulting in death, due to its unique, intangible and complex nature, characterised by subjectivity and independence in execution and decision making away from human intervention. Moreover, the involvement of different people in its development raises the following question:

To what extent can the general rules of civil liability, aimed at compensating damages resulting from the use of artificial intelligence, be applied in Algerian law?

To answer this question, it is necessary to resort to certain research methods in the field of legal sciences. We will use an analytical approach to examine and analyse the legal texts related to civil liability in order to determine whether their provisions can be applied to artificial intelligence. In addition, a descriptive method will be used to clarify and remove ambiguities regarding some concepts related to the topic.

Accordingly, we have divided this research into three sections as follows:

- Section One: The Concept and Applications of Artificial Intelligence

- Section Two: The Applicability of Classical General Rules of Tort Liability to Damage Caused by Artificial Intelligence

- Section Three: The Possibility of Compensating for Damage Caused by Artificial Intelligence Based on Emerging Objective Liability

2. Section One: The Concept and Applications of Artificial Intelligence

2.1 Subsection One: Definition of Artificial Intelligence

Abbreviated as AI, it is a branch of computer science concerned with enabling computers to simulate aspects of human intelligence, such as speech recognition, reasoning, deductive thinking, creative response, the ability to learn from experience, and the capacity to draw inferences from incomplete information. General areas of artificial intelligence research include expert systems and natural language processing[1].

Among the earliest attempts in this field is the test proposed by the English scientist Alan Turing, who in the 1930s described a hypothetical machine capable of identifying problems that could be solved by machines, capable of writing and reading symbols, and capable of operating autonomously.

Turing devised a test to determine the intelligence of a machine, which is carried out by placing the machine in a closed room connected to a terminal in a corridor. A human is placed in another closed room, also connected to a terminal in the same corridor. Another person (the judge) is in the corridor and interacts with both the machine and the first person, having a dialogue with each to determine which is the human without seeing them. The machine's intelligence and reasoning ability are measured by its success in fooling the judge.

Turing's test has faced considerable opposition, mainly due to its reliance on the intelligence of the judge, despite laying the foundations for research into artificial intelligence and machine intelligence. This test is considered to be practically unfeasible.

While the term "artificial" refers specifically to machines or computers, artificial intelligence can be defined as: "the machine's response described as intelligent".

Elon Rich sees AI as "the science of getting computers to do tasks that humans do, but better".

Another definition of artificial intelligence, provided by Afrom Bar and Edward Feigenbaum, is that "artificial intelligence is a branch of computer science that aims to design intelligent systems that exhibit the same characteristics that we recognise as intelligence in human behaviour".

While Bruce Buchanan and Edward Shortliffe define artificial intelligence as "that branch of computer science that seeks to solve problems using non-algorithmic symbol processing," it is well-known that computers process numbers and convert all data into numerical forms without the ability to handle symbols or images. The architecture of these machines relies on algorithms, which are logical sequences from a defined beginning to a defined end representing the solution to a problem. In contrast, human mental processes depend on acquiring experiences and building a reservoir of knowledge through trial and error or empirical methods. According to this definition, knowledge is represented symbolically and processed experimentally.

Another definition of AI states: "Artificial intelligence operates on the principle of mirror configurations that can be used to describe objects, events and processes by their qualitative properties and logical and computational relationships". Although computers have a greater capacity to store information than humans, humans have a greater capacity to recognise relationships between objects. Using this human ability, one can understand images of landscapes, images of people and components of the external world, grasping their meanings and interrelationships. If this ability could be embedded in a computer, it would become intelligent.

[1]- - Dictionary of Computer Terminology (in Arabic and English), Damascus: Syrian Scientific Association for Informatics, 2000, p. 24.

Despite these multiple definitions, a definitive definition of artificial intelligence has yet to be reached. The prevailing view today is to define AI as the study of human cognitive abilities, using computational models to imbue computers with some of these abilities. Despite the differences in definition, AI remains a field that focuses on designing and programming machines to perform tasks that require human-like intelligence in their execution.

The disagreement among AI researchers extends beyond the definition to how intelligent behaviour can be represented. While one group believes that the representation of intelligence should be achieved through models that simulate human cognitive processes, another group uses the term machine intelligence, claiming that it can be achieved through any technique that leads to it.

It is worth noting that early artificial intelligence research focused on building software aimed at endowing computers with general intelligence and the capacity for thought. However, these efforts achieved little and faced failures beyond what could be anticipated, not only because intelligence is a trait that distinguishes and honors humanity, or because the nature of intelligence itself was not well understood by those who exaggerated the capabilities of computers at that time, but also because studies and research by mathematicians, natural scientists, and humanists demonstrated that human thought is not a mechanical process that can be simulated or its secrets understood[2].

2.2 Subsection Two: Applications of Artificial Intelligence

The applications of artificial intelligence have diversified across various fields of exploitation and use. We will explore the most significant of these applications, both at their inception and in terms of the latest scientific developments in this area and their relation to the activities in which they are employed.

2.2.1 First Branch: The Emergence of Artificial Intelligence Applications

Artificial intelligence has ancient roots, particularly through myths and tales of artificial beings endowed with intelligence. The foundations of modern artificial intelligence were established by philosophers who embraced the idea of creating robotic men or machines to perform human tasks through artificial intelligence, ultimately leading to the invention of the programmable digital computer, the Atanasoff-Berry Computer (ABC) in the 1940s, a machine based on the essence of logical mathematical thinking. This device and the ideas behind it inspired some scientists to discuss the possibility of building an electronic brain.

Several methods can be considered the foundations of modern artificial intelligence, including the following applications:

1. Artificial Neural Networks:

Artificial neural networks are among the types of artificial intelligence applications, defined as systems for processing data in the same way that the natural neural network of humans or living organisms does[3], that is, the human nervous system. They are also defined as the science that studies mathematical methods that can be formulated based on the simulation of biological cells in living organisms. Neural cells are characterized by their speed in processing data and their ability to learn and handle various patterns of data, some of which may be erroneous, making them suitable for many

[2]- Abdel Hamid Basyouni – Artificial Intelligence for Computers and Introduction to Prolog - University Publishing House, Egypt, 1993, 1st Edition, pp. 17-20.

[3]- Mazen Abdul Rahman Khatibeh, The Use of Artificial Intelligence in Electrical Engineering Applications: A Comparative Study - Thesis submitted as part of the requirements for a Master's degree in Management Information Systems, Arab Academy, Denmark, 2009, p. 33.

applications such as image and speech recognition[4]. Artificial neural networks have several characteristics, including:

- They are based on a strong mathematical foundation and represent one of the applications of technology for intelligent information processing modelled on human cognition.

- They can accept any type of quantitative or qualitative data and have the ability to store knowledge acquired through the cases they have processed.

Among the most important applications of artificial neural networks are the following, which have provided many efficient solutions in various fields:

- Pattern Recognition and Image Identification

- Ability to recognise distorted images

- Completing images with missing parts

- Classification into different categories

- Remote control operations

2. Fuzzy Logic

Fuzzy logic is considered one of the applications that fall under the umbrella of artificial intelligence in operations. While intelligent computer systems rely on specific data, fuzzy logic systems deal with ambiguous, probabilistic, and undefined data through reasoning that resembles human reasoning. This allows for approximation using incomplete values and data, enabling inferences based on them.

3. Intelligent Agent

An intelligent agent is an application for data mining from the internet or online databases. The intelligent agent operates through a software package that performs specific tasks or duties that are repetitive or predictive for the user and supports business activities or other software applications. Intelligent agents are also used by e-government to respond to customer messages, address their requests, and gather feedback on product or service quality. Today, there are many applications of intelligent agents in operating systems, networking tools, and e-commerce.

4. Robotics (Smart Robotic Arm)

Robotics is among the mechanical devices capable of grasping, moving, and transporting materials. They perform tasks that pose a risk to human life, characterized by precision, speed, and strength enhanced by sub-machines. For example, Ford uses robots for 98% of its operations. Robotics consists of:

- A manual worker who carries a machine to perform tasks.

- A control and monitoring system that provides guidance or facilitates manual processing[5].

5. Natural language processing

Natural language processing is a branch of artificial intelligence, which itself is a branch of computer science and overlaps significantly with linguistics, providing the necessary linguistic employment for computers. This science makes it possible to develop software capable of analysing, simulating and understanding natural language, which is used in various fields, including

[4]- Hanan Hamid Ali Al-Dulaimi and Lehib Muhammad Ibrahim Al-Zubaidi, Using the Artificial Neural Network NewContron to Distinguish Handwritten Arabic Numbers, Al-Rafidain Journal of Computer Science and Mathematics, 2009, Volume 6, Issue 1, p. 49.

[5]- Ghassan Qassem Al-Lami, Technology Management: Concepts and Stages of Practical Application Techniques, Dar Al-Manahij for Publishing and Distribution, 1st Edition, 2017, pp. 154-155.

- Text reading

- Text or speech generation

- Extraction of information

- Translation techniques

- Text editing[6]

6. Visual systems and case-based intelligent systems

A. Visual systems:

Visual systems are those that link video imaging devices to computers and are often used in inspection processes. Visual inspection is crucial in manufacturing companies, such as food production, and is widely used when the items to be inspected are very similar. These systems are characterised by their speed and have many applications, including sorting, classification, guidance, monitoring and quality control[7].

B. Case-based intelligent systems:

These systems and technologies use case-based intelligence to provide rapid solutions by relying on the ability to perceive previously stored process cases related to the problem and decision subject. This technology is also referred to as Organisational Intelligence because it deals with the accumulated knowledge and experience within an organisation, working to acquire, store and later use this knowledge[8].

7. Genetic Algorithms:

Just as neural network systems rely on the idea of simulating the structure and functions of the brain, albeit to a small extent, genetic algorithm systems are based on the concept representing the biological evolution of living organisms. This technique first emerged in the 1970s through the research efforts of John Holland from the University of Michigan in the United States.

2.2.2 Second branch: Modern applications of AI

1. ChatGPT application:

ChatGPT is a robot developed by OpenAI and is considered to be one of the best artificial intelligence applications, with an exceptional ability to interact with users through text-based conversations and provide responses that closely match human responses. ChatGPT uses Natural Language Processing (NLP) technology, drawing on books, websites and thousands of different articles available online as sources of information, which it then uses to formulate its own language and interact with users.

What makes ChatGPT a technological revolution is that it is programmed to teach itself and understand what users mean when they ask questions. Many users are in awe of its ability to give human-like answers, creating a sense that it may eventually acquire the ability to disrupt the way humans interact with computers and make independent decisions.

ChatGPT also relies on reinforcement learning, retaining and analysing human feedback to improve its ability to select appropriate responses. The factor that makes ChatGPT the most significant application of artificial intelligence is its versatility for almost any task. While it may appear to be a highly intuitive conversational AI application like others, it can also assist in

[6]- Ghada Mounajem et al., Research on Artificial Intelligence in Decision Support Systems, College of Administrative Sciences, King Saud University, Saudi Arabia, no year, pp. 27-29.
[7]- Ghassan Qassem Al-Lami, previous reference, p. 153.
[8]- Mohamed Samir Ahmed - E-Government, Dar Al-Maysarah for Publishing and Printing, 1st Edition, Amman, 2019, p. 160.

- Brainstorming to generate as many ideas as possible by providing it with keywords or topics the user wants to explore.

- Creating written marketing content to target a specific audience, such as marketing social media posts.

- Providing appropriate responses to different user emails.

- Translating text from one language to another.

- Writing code and identifying and correcting errors in existing code.

- Writing articles and stories in highly articulate language.

2. Personal Assistant Siri:

It is certain that the famous virtual assistant Siri from Apple is one of the most widely used and recognized artificial intelligence applications. Siri provides voice instructions to users, can make calls, send text messages, answer questions, and offer recommendations. Furthermore, Siri can adapt to users' language and their specific online search processes to prioritize information relevant to them. Using the machine learning technology specific to the Siri application, it can gather information from various sources and present it to users to answer their inquiries. The application can also control other devices that operate on iOS.

Due to its remarkable ability to simulate natural speech and respond to queries, this application is one of the most practical artificial intelligence tools for daily use. Additionally, Siri is configured to speak over 20 different languages worldwide. Therefore, it can be said that Siri is one of the best artificial intelligence applications utilizing voice systems, capable of interacting quickly with human users.

Siri's popularity is evident globally; a survey conducted in 2018 showed that 44% of smartphone users who use voice assistant services prefer Siri.

3. Cortana:

Cortana is considered one of the best artificial intelligence applications. Originally developed as a virtual assistant for the Windows operating system, it was later integrated into Android, making it functional on both platforms. Cortana’s technology is primarily based on receiving voice commands, analysing them, and executing them efficiently and quickly to help users complete their tasks as quickly as possible.

Cortana uses natural language to communicate with users. By giving direct voice commands, you can activate Cortana to perform various tasks, such as searching for something online, checking your email, updating your schedule, and more.

The Cortana virtual assistant also offers an additional feature that allows users to link their Windows computers with their Android smartphones to receive any type of notification from their computers on their phones and vice versa. This allows users to navigate between their stored files on their computers and phones more quickly through this application.

4. Amazon Alexa:

For many, the Alexa application is considered one of the best artificial intelligence applications available today. This virtual assistant allows users to listen to music, add items to their Amazon shopping cart, predict the weather and much more.

This application is available on all major platforms, such as the Google Play Store and the Apple Store, and can be used to connect different mobile devices owned by the user.

One of the most notable features of this application is its ability to connect to devices programmed to work with Alexa, allowing it to control smart home devices, tablets, televisions, air conditioners and even cars, all through the phone.

By converting speech into text, Alexa provides accurate answers to any question asked, which is why many people use it in their daily routines and at work.

5. Google Assistant:

Launched in 2016, the Google Assistant application has made great strides since its inception and is now one of the most advanced artificial intelligence applications available.

Google has partnered with many companies to make Google Assistant available on a wide range of devices, including smartphones, smart home devices, headphones and cars.

Google Assistant supports both voice and text commands and offers a range of services including voice search, finding information online, scheduling and reminders, and real-time translation of words from different languages.

The tasks that Google Assistant can perform can range from simple and intuitive to highly advanced and complex. Either way, it will undoubtedly simplify the tasks that users perform. This application can also control electronic devices in the home if they are compatible with its operating system[9].

3. Section Two: The Applicability of Classical General Rules of Tort Liability to Damage Caused by Artificial Intelligence

Civil liability in tort is the penalty for harmful acts that cause damage to others, and arises when its elements are present[10]. These elements vary according to the type of liability. In general, in tort, in addition to the element of damage requiring compensation, there is also a deviation from the usual behaviour of an ordinary person. The latter is what distinguishes civil liability from criminal liability, which requires only the commission of a criminal offence.

While these general rules form the basis for establishing tort liability for natural persons, artificial intelligence, despite its advanced applications, may also make mistakes that cause harm to others. We therefore question the applicability of traditional rules of tort liability to compensate injured parties. If the answer to this question is in the affirmative, it brings to mind another principle: personal tort liability depends on the legal personality of artificial intelligence (first condition).

On the other hand, we also question the possibility of considering liability for the actions of things as a basis for compensation for damage caused by artificial intelligence (second requirement), and the extent to which artificial intelligence can be held accountable for the actions of others (third requirement).

3.1 First Requirement: Legal Personality as the Basis for Personal Liability of Artificial Intelligence

The foundation of personal tort liability is the commission of an error by a person that causes harm to others, thereby necessitating compensation. However, in this case, there is a person to whom this error can be attributed, raising the question: Can artificial intelligence be considered a person in the

[9]- [Best Applications of Artificial Intelligence in Modern Times](https://www.for9a.com/learn/أفضل-تطبيقات-الذكاء-الاصطناعي-في-العصر-الحديث) (Accessed on 05-09-2023 at 19:23).

[10]- Abdel Rahman Al-Sharqawi - Civil Law - A Modern Study of the General Theory of Obligation in Light of New Economic Law Concepts, Sources of Obligation - Legal Fact - Al-Maaref New Press - Rabat, 4th Edition, 2020, p. 41.

legal sense (First Branch)? Moreover, can the error, as a fundamental element of this type of liability, be attributed to artificial intelligence, thus establishing personal tort liability for it? (Second Branch)

3.1.1 First Branch: The Possibility of Granting Legal Personality to Artificial Intelligence

Acquiring legal personality is crucial, especially concerning the acquisition of rights and the assumption of obligations. As is known, legal personality according to Algerian civil law, as stated in Article 25, is established for a human being upon the successful birth and ceases upon death. This means that a person has the capacity to acquire rights and assume obligations. Upon reaching the age of 19, an individual gains full capacity to act, allowing them to engage in all legal acts and bear full legal responsibility.

Regarding legal entities, Article 49 of the civil code stipulates that upon acquiring legal personality, as outlined in Article 50 of the same code, rights become capable of acquisition, and obligations can be assumed, including liability for damages caused to others.

Thus, an intelligent system is neither a human nor a legal entity to be granted natural or legal personality. Since the system is connected to a tangible carrier (hardware), it does not fall under natural or legal persons and possesses a unique nature that makes it exempt from the legal personality framework of the applicable legal system[11].

From a doctrinal perspective, scholars have diverged on this issue. Some reject the idea of granting legal personality to artificial intelligence, asserting that legal personality is a concept created by humans to organize human relationships, making it unreasonable to apply it to virtual persons or robots. They argue that such recognition would absolve the manufacturer of responsibility[12].

Conversely, others advocate for recognizing legal personality for virtual persons and robots, based on the notion that "all humans are persons, but not all persons are humans.[13]" Consequently, the characteristics of artificial intelligence extend beyond merely being considered an object or machine. Its programming enables it to act and react, prompting legal scholars to propose granting it virtual personality, as society needs to clarify its legal status to fulfill obligations and acquire certain rights within its nature.

On 16 February 2017, the European Parliament passed a historic resolution calling on the European Commission in Brussels to propose civil law rules for robots. The aim was to create a specific legal framework to regulate civil liability for autonomous, intelligent robotic systems. The resolution urged the Commission to recognise a special personality for robots, allowing advanced autonomous entities to be treated as electronic persons responsible for compensating for the damage they cause to others. This would address the shortcomings of traditional civil liability rules in dealing with the risks posed by new generations of autonomous robots, whose actions cannot be predicted and whose damages cannot be compensated[14].

The European Parliament also recommended the mandatory insurance of artificial intelligence through an insurance document linked to an insurance fund to cover its independent and unpredictable actions[15].

[11]- Amal Belabbas - The Suitability of Civil Liability Rules to Compensate for Damages from Smart Systems, Legal and Economic Research Magazine, Volume 6, Issue 1, 2018, p. 461.
[12]- Fatima Nasakh - The Legal Personality of the New Being: "The Virtual Person and the Robot," Research Journal for Legal and Political Studies, Volume 5, No. 1, 2020, p. 220.
[13]- Fatima Nasakh - same reference.
[14]- Hossam Al-Din Mahmoud Hassan - The Reality of Legal Personality for Artificial Intelligence, Journal of the Spirit of Laws, Volume 35, Issue 102, April 2023, p. 156.
[15]- Hossam Al-Din Mahmoud Hassan, previous reference, p. 156.

Returning to the Algerian legal system, we find that the law recognises only natural persons and legal entities, leaving the artificial intelligence system without personality and therefore incapable of acquiring rights or assuming obligations.

3.1.2 Second branch: The possibility of establishing personal tort liability for artificial intelligence

The basis of liability for personal acts in Algerian civil law is Article 124, which states: "Any act, whatever its nature, committed by a person through fault, obliges the one who caused it to pay compensation".

Liability for personal acts is thus based on fault, damage and causation. Fault is defined as a breach of a legal duty by a person with knowledge of that breach. If a person deviates from the ordinary behaviour expected of a typical individual, and is aware of this deviation, it is considered a fault that gives rise to tort liability[16]. There are two elements of fault: the material element, which is the breach of the duty not to harm others, and the deviation from the behaviour of an ordinary person, whether intentional or unintentional. In both cases, the right to compensation arises when the injured party can prove the fault that caused the damage.

In addition, there is the moral element represented by consciousness, which means that the perpetrator of the fault must be aware of his actions, and this awareness depends on the capacity to discern, according to Article 125 of the Algerian Civil Code. This aspect excludes the possibility of holding artificial intelligence personally liable for the damage it causes to others. Given that artificial intelligence, as a source of damage, consists of software that may or may not be connected to a physical medium, the application of personal civil liability to artificial intelligence becomes complex.

Furthermore, the immaterial nature of AI means that its actions and behaviours are intangible, which leads to challenges in proving fault, since establishing liability for personal acts depends on proving fault.

For personal tort liability, it is not enough to establish fault; that fault must also cause harm to others. The harm may be material, affecting financial interests, or moral, affecting the non-financial interests of the injured party. It is also required that the harm is actual and not merely potential, and that it is either expected or at least certain to occur.

Harm caused by AI can be material, such as an accident involving a smart car, or it can be moral, such as poor automated behaviour that damages someone's reputation by providing false information. However, it is important to note that one of the characteristics of artificial intelligence is its lack of control, its lack of sensory perception and its spatial unboundedness, i.e. it is not confined to a specific geographical area[17].

In addition to the elements of fault and damage, there must be a relationship between the fault and the damage, known as causation, which can be negated if an external cause is established. Here, because the behaviour of AI is invisible and does not leave tangible traces that can be proven, and because it is not confined to a specific geographical area, it becomes difficult to link the fault to the damage it causes. Therefore, it can be concluded that we cannot apply the rules of liability for personal acts due to the incompatibility of the elements of liability with the nature of the acts and damages caused by artificial intelligence.

3.2 The second requirement: The possibility of holding artificial intelligence responsible on the basis of the law of the thing

[16]- Belhaj Al-Arabi - General Theory of Obligation in Algerian Civil Law - 5th Edition, Publications of University Press, p. 63.
[17]- Amal Belabbas - previous reference, p. 465.

Article 138 of the Algerian Civil Code states: "Anyone who has taken charge of something and has the ability to use, manage and supervise it is considered responsible for the damage caused by that thing. The guardian of the thing is exempted from this responsibility if he proves that the damage was caused by an unforeseen cause, such as the actions of the victim, the actions of others, an emergency situation or force majeure".

From the above article, it is clear that this type of responsibility presupposes the existence of an object that causes harm to others and the presence of a guardian for that object, who has the authority to use, manage and supervise it, whether he is the owner or not. This responsibility is based on an objective rather than a personal basis, and in Algerian law liability for the act of things is presumed by force of law; it is not based on the idea of fault, but is presumed as soon as an inanimate thing causes damage[18].

Moreover, the concept of "thing" is material and tangible, and refers to the real world rather than the virtual. It becomes clear that it is difficult to associate a "thing" with artificial intelligence, since it would be unacceptable to consider AI as a mere digital program capable of learning and acquiring skills, acting independently - thus associating it with the virtual rather than the real world[19].

However, when discussing the concept of guardianship, the question arises: Who is the guardian of a smart system? Is it the programmer, the user or the owner?

Article 138 of the Algerian Civil Code links the responsibility of the guardian to the authority to use, manage and supervise the thing under guardianship, whether he or she owns it or not. While the description of the guardian may apply to a robot or an entity with artificial intelligence without reasoning, it often does not apply to the AI itself, especially if it possesses independence; it cannot be subjected to supervision and management[20].

Thus, it becomes clear that responsibility for things is based on the premise that the guardian of the thing is responsible for the actions of the thing under its control, and is capable of directing, managing and supervising it. This perspective implies that artificial intelligence is subject to the guidance and supervision of a guardian, which does not correspond to the reality of artificial intelligence. It is characterised by its ability to learn and its independence in making decisions without any guidance. In addition, it is difficult to determine who should be considered the guardian of artificial intelligence - whether it is the designer, the owner or the user. Among these, who has the authority to direct and supervise it remains uncertain, as it is designed to operate freely, without any supervision or guidance[21].

3.3 Third Requirement: The Possibility of Holding Artificial Intelligence Liable Based on the Acts of Others

The Algerian legislator has addressed two types of liability based on the acts of others: the liability of the custodian and the liability of the principal for the acts of their agent.

According to Article 134 of the Civil Code, it states: “Anyone who is legally or contractually required to supervise a person in need of supervision due to their minority or mental or physical condition is obliged to compensate for the damage caused by that person to others through their harmful act.

[18]- Belhaj Al-Arabi, previous reference, p. 351.
[19]- Mohamed Ahmed Al-Sharaireh - Smart Civil Liability for Damages from Artificial Intelligence: A Comparative Survey Study, Journal of the International Kuwait Law College, Serial No. 38, Issue 2, March 2022, p. 360.
[20]- Amal Belabbas - previous reference, p. 470.
[21]- Moamer Ben Taria and Qadah Shahida - Damages from Robots and Artificial Intelligence Techniques: A New Challenge for Law, published article in Algerian Annals, Special Issue, 2018, p. 129.

The supervisor can free themselves from liability if they prove that they fulfilled their duty of supervision or that the damage would have occurred regardless of their due diligence."

From this text, it is clear that the liability of the supervisor is based on the assumption of fault and causation. The supervisor can absolve themselves from liability if they prove that the damage could have occurred even if they diligently fulfilled their duty of supervision. This framework is unsuitable for compensating damages caused by artificial intelligence because the person under supervision is a natural person, and the reason for supervision is their minority or mental or physical condition—none of which apply to an intelligent system, as it cannot be subjected to supervision according to Article 134 of the Civil Code due to the absence of natural personhood[22].

With regard to the liability of the principal for the acts of his agent, Article 136 of the Algerian Civil Code states that "The principal is liable for the damage caused by his agent by a harmful act when it occurs during the performance of the agent's duties or as a result thereof or in connection therewith. A relationship of dependence is established even if the principal does not have the freedom to choose his agent, provided that the agent acts on behalf of the principal".

This type of liability is objective, based on damage rather than fault. Since the Algerian legislator does not recognise the legal personality of an intelligent system, it is impossible to apply the principal's liability for the acts of its agent to compensate for damage caused by artificial intelligence. Moreover, the application of Article 137 - which grants the principal the right to seek redress against his agent in the event of gross negligence - requires the existence of the principal's financial capacity, which an intelligent system does not have[23].

4. Section Three: The Possibility of Compensating for Damages Caused by Artificial Intelligence Based on Emerging Objective Liability

Given the difficulty of compensating for damages caused by artificial intelligence—whether based on personal liability, liability for the acts of others, or liability for acts of things—it is necessary to seek a legal basis that can ensure compensation for the damages inflicted on others by artificial intelligence. This involves the liability of the producer for the acts of their products, introduced in Algeria within the provisions of the Civil Code through its amendment in 2005. Therefore, we will explore the possibility of considering artificial intelligence as a product (First Requirement), followed by the potential for compensating the harmed parties based on defects in artificial intelligence (Second Requirement).

4.1 First condition: The Possibility of Considering Artificial Intelligence as a Product

Some scholars have defined a product as "an object, a service, an organisation, an idea or the result of production"[24]. In addition, Article 140 bis of the Civil Code defines a product as "any movable property, even if it is connected to immovable property, in particular agricultural products, industrial products, livestock, products of the food industry, wild and marine fisheries, as well as electrical energy".

In addition, Article 2, paragraph 11 of Law No. 04-04 on standardisation defines a product as "any material, construction material, composition, device, system, process, function or method".

It is clear from the above texts that they give examples of types of products rather than an exhaustive list. Furthermore, as they do not provide a precise definition of a product, it is possible to consider an intelligent system as a product. This is supported by the broad interpretation of the legislator, which includes any movable property, whether tangible or intangible, and allows the applicability of

[22]- Amal Belabbas - previous reference, p. 466.
[23]- Amal Belabbas - previous reference, p. 467.
[24]- Zahia Houri Si Youssef - Civil Liability of the Producer, Dar Houma, Algeria, 2009, p. 40.

producer liability to obtain compensation for some damage caused by intelligent systems, whether to the user or to others[25].

However, the application of producer liability for damage caused by defective products to artificial intelligence poses significant challenges, in particular due to the lack of control over it. This is because the risks inherent in its functions are not necessarily related to manufacturing defects. These aspects make artificial intelligence a source of public risk.

4.2 Second requirement: The possibility of compensating victims due to defects in artificial intelligence

The rules of liability for defective products, which in the field of artificial intelligence are intended to be applied to the manufacturer or programmer as the custodian by nature, are not adapted to the immaterial nature of artificial intelligence. This is evidenced by comparative laws governing this type of liability, which define a product as "movable property", confirming that the legislator did not intend to include immaterial entities[26].

A product is considered defective under the law if it does not meet the expected safety criteria. Thus, the expected level of safety can be inferred from all the surrounding circumstances. The defect that gives rise to liability for a product that does not meet safety standards is not limited to the expected utility of the product. Moreover, the injured party only has to prove the damage and the defect[27].

From this it can be concluded that the application of producer liability may only be suitable for compensating damage caused by intelligent systems in certain cases. However, it does not cover damage caused by self-learning systems through algorithms generated by the intelligence itself, nor does it cover damage caused by independent decision-making. In such cases, it becomes impossible to prove the defect, even if it existed at the time the artificial intelligence was released from the control of the manufacturer or developer. It is also difficult to determine who is responsible for the defect in the AI, as multiple parties are involved in its development and implementation, making it difficult to determine who is liable for the resulting damages. In addition, the role of the user and the increasing autonomy of the AI in performing its tasks complicate this issue[28].

5. CONCLUSION:

Technological progress has led to the creation of intelligent machines equipped with artificial intelligence, which intervene in various fields such as industry, medicine and even services. These intelligent machines may cause harm to others, which necessitates liability to compensate for damage resulting from the use of intelligent systems and machines.

However, it is clear from the previous discussion that the elements of civil liability cannot be applied to the nature of artificial intelligence due to its ability to learn and make independent decisions, as well as its lack of legal personality. In addition, the rules of liability for the actions of things cannot be applied to intelligent systems, given the inability to manage and control these systems due to their autonomy.

In light of the above, we propose the following proposals to fill the legal gap regarding the civil liability of artificial intelligence:

[25]- Amal Belabbas, previous reference, p. 472.
[26]- Mustafa Abu Mandour Musa Issa - The Adequacy of General Rules of Civil Liability in Compensating for Damages from Artificial Intelligence: An Analytical and Comparative Study, Journal of Law College, Damietta University for Legal and Economic Studies, Issue 5, January 2022, p. 372.
[27]- Mohamed Abdul Razak and Wahba Said Ahmed - Civil Liability for Damages from Artificial Intelligence: An Analytical Study, Journal of Advanced Legal Research, Volume 5, Issue 43, p. 28.
[28]- Badri Jamal - Artificial Intelligence: A Legal Approach, Algerian Journal of Legal and Political Sciences, Volume 59, No. 4, 2022, p. 177.

1. The legislator should create a specific system that defines liability for damage caused by intelligent systems.

2. Incorporate the concept of liability for autonomous AI systems into insurance law, thereby making insurance compulsory for the damage they may cause.

3. Establish liability for operators of intelligent systems.

4. Develop specific definitions of artificial intelligence that include all parties involved (the innovator, the manufacturer or producer and the operator) and establish a principle of solidarity in compensation to protect the end user or victim of damage caused by artificial intelligence.

6. REFERENCES:

1. Books:

- Belhaj Al-Arabi - General Theory of Obligation in Algerian Civil Law - 5th Edition - Publications of University Press.

- Zahia Houri Si Youssef - Civil Liability of the Producer, Dar Houma – Algeria, 2009.

- Abdel Hamid Basyouni – Artificial Intelligence for Computers and Introduction to Prolog - University Publishing House, Egypt, 1993, 1st Edition.

- Abdel Rahman Al-Sharqawi - Civil Law - A Modern Study of the General Theory of Obligation in Light of Its Influence by New Economic Law Concepts, Sources of Obligation - Legal Fact - Al-Maaref New Press - Rabat, 4th Edition, 2020.

- Ghassan Qassem Al-Lami - Technology Management: Concepts and Stages of Practical Application Techniques, Dar Al-Manahij for Publishing and Distribution, 1st Edition, 2017.

- Mohamed Samir Ahmed - E-Government, Dar Al-Maysarah for Publishing and Printing, 1st Edition, Amman, 2019.

- Muwafaq Dabboul - Dictionary of Computer Terminology (in Arabic and English), Damascus, 1st Edition - Syrian Scientific Association for Informatics, 2000, available online at: [link](https://archive.org/details/SOI2000ENAR/mode/2up).

2. University Research:

- Mazen Abdul Rahman Khatibeh, The Use of Artificial Intelligence in Electrical Engineering Applications: A Comparative Study - Thesis submitted for the requirements of a Master's degree in Management Information Systems, Arab Academy, Denmark, 2009.

3. Published Articles:

- Amal Belabbas - The Suitability of Civil Liability Rules to Compensate for Damages from Smart Systems - Legal and Economic Research Magazine – Volume 6, Issue 1, 2018, pp. 456-478.

- Badri Jamal - Artificial Intelligence: A Legal Approach - Algerian Journal of Legal and Political Sciences, Volume 59, No. 4, 2022, pp. 173-190.

- Hossam Al-Din Mahmoud Hassan - The Reality of Legal Personality for Artificial Intelligence - Journal of the Spirit of Laws, Volume 35, Issue 102, April 2023, pp. 103-248.

- Hanan Hamid Ali Al-Dulaimi and Lehib Muhammad Ibrahim Al-Zubaidi - Using the Artificial Neural Network NewContron to Distinguish Handwritten Arabic Numbers, Al-Rafidain Journal of Computer Science and Mathematics, 2009, Volume 6, Issue 1, pp. 47-59.

- Ghada Mounajem et al. - Research on Artificial Intelligence, College of Administrative Sciences, King Saud University, Saudi Arabia, no year.

- Fatima Nasakh - The Legal Personality of the New Being: “The Virtual Person and the Robot” - Research Journal for Legal and Political Studies, Volume 5, No. 1, 2020, pp. 213-227.

- Mohamed Ahmed Al-Sharaireh - Smart Civil Liability for Damages from Artificial Intelligence: A Comparative Survey Study - Journal of the International Kuwait Law College, Serial No. 38, Issue 2, March 2022, pp. 357-408.

- Mohamed Abdul Razak and Wahba Said Ahmed - Civil Liability for Damages from Artificial Intelligence: An Analytical Study - Journal of Advanced Legal Research, Volume 5, Issue 43, pp. 11-45.

- Mostafa Abu Mandour Musa Issa - The Adequacy of General Rules of Civil Liability in Compensating for Damages from Artificial Intelligence: An Analytical and Comparative Study - Journal of Law College, Damietta University for Legal and Economic Studies, Issue 5, January 2022, pp. 209-403.

- Moamer Ben Taria and Qadah Shahida - Damages from Robots and Artificial Intelligence Techniques: A New Challenge for Law - Algerian Annals, Special Issue, 2018, pp. 119-142.

4. Decisions and laws:

- Algerian Ministry of Justice, Decree No. 75-58 of 20 Ramadan 1395, corresponding to 26 September 1975, containing the Civil Code, as amended and supplemented, Official Journal No. 78 of 30 September 1975, page 990.

5. Internet:

- A. Web:

[Best Applications of Artificial Intelligence in Modern Times](https://www.for9a.com/learn/أفضل-تطبيقات-الذكاء-الاصطناعي-في-العصر-الحديث) (Accessed on 05-09-2023 at 19:23).