



The Scope of Legal Liability for Artificial Intelligence

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Abstract:

The global world has witnessed a remarkable technological shift as we moved from the twentieth century into the twenty-first, with artificial intelligence standing out as a groundbreaking innovation whose standout features are the ability to make decisions and carry out tasks without needing human input.

This technology has woven itself into many facets of our lives, from education and healthcare to security and justice. However, as we embrace these advancements, we also face new legal hurdles, particularly around who is held accountable for the actions and consequences of AI.

Keywords: artificial intelligence, liability, technological advancement, ...

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I. Introduction:

We're living in a time where technology is evolving at lightning speed, especially in the realm of artificial intelligence. This innovation is making a significant mark on our daily lives, becoming a crucial part of how we function as individuals and as a society. From security and healthcare to education, the judiciary, military, commerce, and beyond, AI is woven into the fabric of many fields. Yet, with these advancements come tricky legal questions about who is responsible for the actions and consequences that arise from its use.

In this landscape, traditional laws are facing challenges like never before, particularly in countries that haven't yet updated their legal systems to address these changes. Many still lack a clear set of rules to govern AI and the liabilities that come with.

Importance of the Research:

This research is important because it seeks to create a foundational framework for understanding the legal liability associated with AI, especially in light of the technological surge we're experiencing globally and its extensive use in various aspects of life.

Research Problematic:

This study prompts us to consider: how far can legal liability extend when it comes to the actions of artificial intelligence?

Research Objectives:

The goals of this study can be summed up as follows:

- ✓ Clarifying what we mean by artificial intelligence.
- ✓ Exploring the concept of giving legal rights to AI entities
- ✓ Outlining the boundaries of legal accountability that come from AI actions and the heated debates that follow.

To address this issue, we used a descriptive approach to highlight the characteristics of AI, an analytical method to examine and interpret the legal decisions related to the accountability stemming from AI actions, and a dialectical approach to showcase the arguments and evidence from both proponents and critics of this notion.

For this study, we organized the paper into two primary sections:

Section One: The concept of AI

Section Two: The boundaries of legal liability of AI

1. The concept of artificial intelligence (AI)

The rise of the Fourth Industrial Revolution has sparked a remarkable transformation in technology and digital progress. At the heart of this revolution is artificial intelligence, which has become a key topic of interest both globally and locally.

AI is making waves in so many areas of our lives. It's starting to match human abilities in a variety of skills, perceptions, and even ways of thinking. Nowadays, it's taking the lead in fields like education, healthcare, business, the military, and beyond.

The term "artificial intelligence" can feel a bit mysterious: how do these technologies manage to understand, perceive, predict, and interact with the world around them so effectively? To shed some light on this, we'll dive into what AI really means, its key features, and the different types that exist in this section.

1.1 Definition of AI

Artificial intelligence is at the heart of the cutting-edge technologies we see shaping our world today. There are many ways to define artificial intelligence, but one popular definition describes it as "a branch of modern computer science that investigates advanced techniques for carrying out tasks and making deductions that mimic, though in a limited way, the reasoning we associate with human intelligence(Bessas & Souiki, 2025, p.27)."

AI is often described as "the field of computer science focused on creating and designing programs that can imitate human intelligence. This allows computers to take on tasks that typically require human abilities like reasoning, understanding, listening, speaking, and moving in a logical and organized way(Benouda, 2022, p.190)."

Artificial intelligence can be described as a way to create or control computers and robots, enabling them to think in a manner similar to intelligent humans. This field of study dives into how our brains work, how we learn, make decisions, and tackle problems. By understanding these processes, researchers can develop smart programs and systems that mimic human-like intelligence(Hachem & Meliani, 2024, p.50).

Others have described it as "a rapidly growing field in computer science(Naceur & Djilali, 2024, p.20)," and it's also referred to as "the science and engineering of creating intelligent machines." The main aim of artificial intelligence technology is to understand the intricate and complex processes that our minds go through during deep thinking. The goal is to translate these processes into computational operations that boost a computer's ability to tackle complex and challenging tasks (Sid & Meriem, 2024, p.922).

It's often referred to as an "information system that has cognitive abilities akin to those of humans," or simply a computer application or machine that takes on tasks usually handled by human intelligence(Guendouz, 2024, p.1183) or a computer system that can imitate how humans think, act, and perform various tasks(Leila, 2023, p.448).

The United Nations describes artificial intelligence as "the new frontier for humanity." Once we cross this frontier, AI is set to usher in a new era of human civilization. The key idea behind artificial intelligence isn't about becoming independent or replacing human intelligence; rather, it's about ensuring its growth through a human-centered approach that prioritizes values and human rights(Degga & Hennich, 2024, p.233).

The World Intellectual Property Organization defines artificial intelligence as "a branch of computer science focused on creating machines and systems that can carry out tasks typically requiring human intelligence, either with some human input or completely on their own(Karel, 1983, p.11)."

It's clear that coming up with a solid and all-encompassing definition of artificial intelligence is no easy feat, and there are a couple of reasons for that. First off, this technology is always evolving, which makes it hard to predict where it's headed next.

On top of that, the wide range of AI programs, techniques, and systems, along with their varied applications in different fields, adds another layer of complexity when it comes to pinning down what AI really is and what it can do(Ahmed & Ali, 2025, p.400).

When it comes to the legal definition of artificial intelligence, the current laws in Algeria don't really offer a clear definition. That said, there are some regulations and decrees that touch on the use of AI technologies in certain areas.

For instance, the law on e-commerce allows for the use of modern technologies, including smart software, in e-contracts(Law No.18-05, 2018). Plus, there's a presidential decree that sets up the Higher School of Artificial Intelligence(Decree No.21-323, 2021).

1.2 Characteristics of Artificial Intelligence

Artificial intelligence stands out as one of the most groundbreaking technological advancements that has reshaped our digital world. Its remarkable traits allow it to outshine traditional systems. These traits include self-learning, decision-making, perception, creativity, innovation, and problem-solving. We'll dive deeper into each of these aspects in the points that follow:

- ✓ One of the most striking aspects of AI is that it's a man-made creation that possesses its own form of intelligence, allowing it to compete with humans. This sets it apart

from human intelligence, which is rooted in our ability to gather and analyze information, tackle complex problems, and grow through the experiences and challenges we face every day, all while drawing on the mental faculties that many believe are inspired by a higher power(Ghezlan & Younsi, 2024, p.99).

- ✓ Artificial intelligence systems have this incredible knack for learning and adapting to new situations. This means they can tackle tasks that, not too long ago, were thought to be exclusive to humans. By learning from data and experiences, they keep picking up new knowledge, which helps them get better and better over time—all without needing a human to step in(Hechmi & Meliani, 2024, p.50).
- ✓ The rise of artificial intelligence can be traced back to algorithms, which are essential for the success of companies working in the realms of AI and machine learning(Belhout, 2024, p.18).
- ✓ Artificial intelligence systems are designed to be autonomous, accurate, and objective. They operate without bias, racism, or preconceived notions, and are not swayed by external influences or personal opinions. Plus, they function without emotions and remain unaffected by the environment around them(Ahmed & Ali, p.401).
- ✓ Inference is a key part of logical reasoning, where we pull together the necessary facts and data. Artificial intelligence systems have a remarkable knack for spotting and analyzing patterns in data, often doing so much more effectively than humans can. This process of inference relies on the vast amounts of information these systems gather, enabling them to come up with appropriate solutions to specific problems based on what they've learned before. They achieve this by not only storing potential solutions but also using inference rules and logical strategies to guide their reasoning(Hamza & Salah, 2025, p.209).
- ✓ There are countless apps that play a crucial role in our everyday lives, like smartphones and smart systems such as GPS and electronic simulation tools(Sid & Meriem, p.937).

1.3 Types of Artificial Intelligence

Artificial intelligence comes in various forms, depending on the areas where it's applied and the techniques used. We can break it down into several categories:

Superintelligent AI:

Right now, these models are mostly just ideas or projects still in the experimental stage. This kind of artificial intelligence refers to the goal of creating AI that can outsmart humans in specific tasks. It has two main features: the first is self-awareness, which aims to grasp human thoughts and emotions that drive our behavior.

The second feature is known as the theory of mind. This represents the next step in AI development that scientists are actively pursuing. In this stage, machines will have the ability to anticipate the feelings and attitudes of others, allowing them to engage in more meaningful interactions(Hechmi & Meliani, p.50).

General or Strong AI:

When we talk about General or Strong Artificial Intelligence, we're diving into a realm of AI that's incredibly sophisticated and powerful. This kind of intelligence goes beyond just mimicking the real world; it actually engages with the various elements within it. Ideally, strong AI should be able to tackle any intellectual challenge that a human can handle, much like narrow AI systems do.

But here's the kicker: it can go even further. Strong AI systems have the capability to learn from their experiences and spot predictive patterns, allowing them to apply that knowledge to a wide array of situations and tasks that they haven't encountered before, even if those scenarios weren't part of their initial training or existing algorithms(Degga & Henich, p.235).

Weak AI:

Weak Artificial Intelligence, often referred to as narrow AI, is designed to mimic intelligent behavior within a specific domain. A great example of this is *Apple's intelligent personal assistant*, which taps into the internet as a vast database to answer users' spoken queries and hold conversations with real people. However, it operates within a limited scope, which becomes evident when it struggles to provide accurate responses in conversations outside its programming. While these weak AI applications excel at their specialized tasks, like robots in manufacturing (Souad, 2022, p.96), they are confined to their designated roles.

2. The boundaries of legal liability of AI

We're living in an incredible time right now, marked by a remarkable technological renaissance that's sparking an information revolution like we've never seen before. This wave of innovation is reshaping so many areas of our lives. Intelligent systems are stepping up, taking on complex tasks and making decisions that can have a real impact on both individuals and society as a whole.

However, with these advancements come new legal challenges, and one of the biggest issues we face is figuring out who is legally responsible for the actions and damages that arise from using artificial intelligence.

When we refer to legal liability, it's important to note that it can differ based on the type of legal rules involved. For instance, civil liability comes into play when someone breaks civil law rules that generally require us not to harm others, leading to what we call tort liability.

On the other hand, if someone fails to meet their contractual obligations, they are held accountable to the other party based on the principles of contractual liability. And then there's criminal liability, which kicks in when a person breaks the rules set out by criminal law and related penal laws.

In this part, we're going to dive into how legal liability rules are qualified to the rise of artificial intelligence.

2.1 Civil Liability

With the incredible progress we've made in artificial intelligence, we're starting to see some real-world consequences that affect others. This calls for a closer look at the legal side of these interactions, figuring out who is at fault, and identifying the individuals responsible for compensating those harmed by AI-related issues.

Civil liability is a major topic when it comes to artificial intelligence. Essentially, it refers to the commitment of a person to make up for any harm they cause to someone else due to not fulfilling a civil duty. This can happen through an action, a lack of action, or even by providing something that leads to damage (Belabbes, 2023, p.459).

It's often referred to as "the duty to make amends for any damage caused by a debtor's failure to meet their obligations. This can fall under two categories: contractual or tortious. It's considered contractual when the harm stems from the debtor not fulfilling a specific obligation outlined in a contract. On the other hand, it's tortious when the harm results from not adhering to a general legal duty, which essentially means not causing harm to others (Imen & Naziha, 2023, p.329)."

When it comes to civil liability for damages caused by AI, we can break it down into two main categories: contractual liability, which applies when there's a contract involved, and tort liability, which comes into play when damage occurs outside of any contractual agreement.

Generally, this isn't too complicated since it's usually straightforward to pinpoint who is responsible for the damage and how the error led to it. Similarly, if there's just damage and a clear link to the responsible party, things are pretty clear-cut. However, challenges arise when it's tough to identify who is at fault, especially since multiple people might be involved in the AI's operation. The situation gets even trickier when AI

actions cause harm to others, as this can be hard to navigate under the existing civil liability laws(Nour, 2023, p.13).

It's clear that the traditional legal rules just don't cut it when it comes to figuring out who's responsible for the damages caused by smart machines. As a result, some folks are trying to tweak and broaden these traditional rules to better fit the world of AI technology. Others are even going a step further, coming up with entirely new legal frameworks that could stand apart from the conventional rules we've relied on for so long(Nour, p.02).

The principles of European civil law have emphasized that the current legal system isn't quite up to the task of handling the liabilities that could arise from the actions of the latest artificial intelligence entities.

This realization has prompted legal experts to push for the creation of a dedicated legal framework for these AI entities, which would allow for tort liability based on their individual actions. This move, of course, hinges on acknowledging their legal personality, much like what we see with natural persons and established legal entities(Zina,,2024, p.257).

In this regard, in 2017, the European Parliament set out to create clear guidelines on the civil liability of robots. This marked the start of a legal framework for artificial intelligence. It acknowledged the role of what they called the human agent—be it the manufacturer, operator, owner, or user of the robot—depending on the situation surrounding the incident caused by the robot and how much control the human agent had over it.

Additionally, there was a push for establishing a legal entity specifically for artificial intelligence that could take on liability in case of any damage, backed by insurance to ensure compensation(Guendouz, p.1187).

2.2 Criminal liability

Once we've laid out the elements of the crime, the next step is to dive into how we determine the criminal liability of the person involved and what kind of punishment fits the bill.

Generally speaking, liability means that an act has taken place—or hasn't taken place—that someone can be held accountable for, facing the consequences of their actions. More specifically, criminal liability hinges on the actual commission of a crime, which must align with the legal definitions of crimes recognized by law. This means that the elements of the crime need to be clearly established, whether it's a felony, misdemeanor, or infraction.

Criminal liability is all about whether someone can face the consequences of their actions and be held accountable for them. It's essentially about a person owning up to what they've done and being subject to any associated penalties(Moussa, 2010, p.27).

It's also referred to as holding individuals responsible for their criminal actions by enforcing the penalties set out in criminal law. When we talk about legal responsibility, we're referring to a rational person's ability to face the consequences of their actions(Meriem, 2023, p.683).

As we dive into the world of artificial intelligence, a lot of problematics pop up about who is actually responsible for crimes that involve these technologies. Before we can tackle this confusion, we first need to get a clear understanding of what artificial intelligence really is from a legal standpoint.

The legal nature of artificial intelligence:

The legal implications of artificial intelligence are incredibly important, as they pose significant challenges across a range of legal areas. This is especially true when it comes to how existing legal rules apply to the various issues that AI brings up, like contractual and tort liability, as well as criminal responsibility, among other legal matters that have typically involved human beings. It raises an intriguing question: *how*

will things shift when artificial intelligence becomes the main driver(Hamza & Salah, p.205)?

When referring to legal systems, it's important to note how it differentiates between people and objects. Each of these categories comes with its own set of rules that fit its nature and the roles it's expected to play. This leads us to the idea of legal personality, which is essentially what drives all legal relationships(Belhadj, 2023, p.222).

We can think of it as the capacity and authority to hold rights and take on obligations as defined by law. For a natural person, this legal personality kicks in at the moment of birth and continues throughout their life. On the other hand, for a legal entity, it's granted to a group of individuals who come together to pursue a specific goal that the legal personality was created to serve(Guendouz, p.1185).

Since AI has not yet received a stable definition, its legal status remains uncertain as it is neither an object nor a person(Belhout, p.14). Consequently, granting it legal personality is a contentious issue with both opponents and supporters. The situation is further complicated by the absence of legal texts addressing this matter; even advanced countries in artificial intelligence, such as the United States, Japan, and South Korea, have not tackled this issue(Azrou, 2025, p.58).

In a surprising move, the Kingdom of Saudi Arabia awarded citizenship to the robot Sophia, marking a significant recognition of her legal status as a person(Djaber, 2025, p.93).

The European Economic and Social Committee has suggested that we might be able to give artificial intelligence its own legal identity. On top of that, the European Parliament put forth a resolution on February 16th, 2017, advocating for a legal status tailored specifically for advanced autonomous robots(Belhout, p.14).

This idea stems from the belief that artificial intelligence will usher in a new era, coexisting with humans. As a result, these autonomous robots could be viewed as electronic entities that should be held accountable for any harm they might cause to others(Guendouz, p.1186).

2.2 Criminal liability for actions committed by AI

After taking a closer look at the legal landscape, it's clear that there's a range of opinions on whether artificial intelligence can be held criminally liable, especially since its nature is quite different from that of humans. So, let's break this down into a few key points:

The opposing stance on establishing criminal liability for AI:

This viewpoint argues that we can't hold artificial intelligence entities criminally responsible, and here are the reasons why:

- ✓ It's tough to hold artificial intelligence accountable for its harmful actions, especially when there aren't any regulations in place that define its responsibilities when things go wrong and harmful(Guendouz, p.1190).
- ✓ The challenge of applying criminal liability comes from the fact that it's hard to imagine punishing AI with jail time or fines, since punishment is meant for intentional harm aimed at deterring future actions. This kind of harm only makes sense(Oualid, 2024, p.1167) when directed at a person who can feel and understand the consequences.
- ✓ Without clear legal guidelines that recognize AI as a legal entity, trying to impose criminal liability on it would go against the fundamental principle of legality regarding crimes and punishments(Djaber, p.93).
- ✓ Legal rules only apply to natural persons, as they are the ones who have the will and understanding necessary for criminal liability.

- ✓ To be held criminally accountable, an individual, two essential elements must be present: the criminal act and the general intent regarding that act. If either of these elements is absent, one cannot assert criminal liability (Mourad, 2022, p.197).

The supportive stance for establishing criminal liability on artificial intelligence:

- ✓ This perspective sees the possibility of acknowledging criminal liability for artificial intelligence entities, based on the following justifications:
- ✓ The idea of replacing human perception with an industrial version is aimed at reducing crimes committed by AI, which has now gained enough awareness and full autonomy in its decision-making. A notable example of this is the robot Sophia that we talked about earlier.
- ✓ Recognizing the criminal liability of AI comes with a host of benefits. It essentially requires AI manufacturers to be transparent about all relevant information and potential risks tied to their creations. This approach helps uphold the idea of vicarious liability for the actions and behaviors of these AI systems.
- ✓ When it comes to holding AI entities accountable for their actions, any penalties imposed should really reflect their nature. This could mean shutting them down, destroying them, or even reprogramming them. By looking at both sides of the argument, it's clear that figuring out how to assign criminal liability to AI is no easy task, especially since we lack legal frameworks that specifically tackle this issue.

✓ **IV. Conclusion:**

As we wrap up this research paper, we come to the conclusion that artificial intelligence stands out as one of the most pivotal outcomes of the Fourth Industrial Revolution. It's a crucial element of this revolution, thanks to its wide-ranging applications in fields like healthcare, security, defense, and education. AI has revolutionized many everyday tasks, turning them into automated processes, which has sparked concerns about the potential loss of numerous jobs.

In light of these advancements, it's clear that we need to take a fresh look at the legal frameworks that govern the use and exploitation of AI, especially considering the new legal and ethical challenges it brings to the table. Throughout this paper, we've uncovered several key insights, the most significant of which include:

- Our exploration of various definitions of AI revealed that there isn't a single, universally accepted definition. Most definitions center around the idea of machines and computer systems carrying out tasks that imitate human intelligence.

- We identified different types of AI, such as weak, strong, and superintelligent AI, with the latter still being a work in progress.

- There's currently no specific law that regulates all facets of AI.

- The legal issues surrounding AI are quite complex, particularly because it lacks legal personality. This raises a heated debate: one side argues that granting it legal status could undermine existing legal frameworks, while the other side believes it's essential to recognize it as a legal entity.

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