Criminal Responsibility for AI Crimes

Monther Sami Abdulrhman Al-Makaneen[1]

Abstract

The research focused on the issue of which crimes fall under the jurisdiction of artificial intelligence. The incorporation of AI programs into different aspects of life entails many challenges, especially regarding the liability for the actions performed by AI and the question of compatibility of the existing legislation with the characteristics of the AI technologies. The state of affairs means that the AI-powered robots may perform actions that prescribe criminal provisions of criminal law, thus raising the issue in the given article as to the possibility of direct criminal penalties for robots, the feasibility of putting the intelligent robots' criminal responsibility into practice by the general principles of the Jordanian Penal Code and the receptiveness of the concept of recognizing the crime to be committed by artificial intelligence. From this perspective, the main research question of the study is: What are the aspects of criminal responsibility stemming from AI mistakes? Thus, its significance is derived from the fact that it explores a new and essential issue, namely, the criminal responsibility for AI crimes within Jordan's legislation. It has great importance in so many spheres, and it is difficult to describe all the aspects of artificial intelligence. The most remarkable outcomes and suggestions of the study show that the legal guidelines for criminal responsibility in Jordan of artificial intelligence crimes remain unrecognized. Thus, it is advised that the legislator proceed with actions to create legislation controlling AI technologies and their use for the purpose of serving the state and citizens' interests. This legislation will guarantee the proper application of the AI capacities within several spheres for the sake of the general public, while taking into consideration all the ethical and legal concerns that relate to using artificial intelligence.

Keywords: *AI, Negligence, Criminal, Robot, Offences*

INTRODUCTION

The swift and huge improvements in electronic industries and artificial intelligence projects have contributed to the creation of new artificial beings that mimic human duties, combining human intellect with machine ability and strength. Artificial intelligence is one of the most prominent elements of our modern period, and the terms artificial intelligence and the Internet, two distinct domains of science and engineering, have some overlap. Artificial intelligence functions similarly to the human mind. Artificial intelligence (AI) is software that performs activities that need human intelligence and learning abilities. Perhaps the most noticeable attribute of artificial intelligence is its better capacity to expand its abilities, learn, and acquire self-experience, which allows it to make judgments independent of a human being. Artificial intelligence is software that performs tasks that require human intelligence and the ability to learn.

The most distinguishing feature of artificial intelligence is its superior ability to develop skills, learn, and build self-experience, allowing it to make decisions independent of humans, as well as the ability to face the most difficult circumstances and confront them as humans do, making it independent in its actions from the owner, operator, programmer, or manufacturer. This necessitates clarifying the principles governing criminal culpability for criminal conduct committed by smart robots. It is worth mentioning that criminal laws have not adequately organized this form of obligation to reflect its unique characteristics.

Statement of the Problem

The problem of the study is that robots equipped with artificial intelligence may commit acts that constitute crimes according to the penal code, which raises a problem related to the extent to which they can be held criminally accountable directly, the extent to which smart robots can be held criminally responsible according to the traditional general rules in the Jordanian Penal Code, and the extent to which the idea of attributing the crime to artificial intelligence is acceptable, i.e. the extent to which artificial intelligence entities can be imagined to commit crimes, and the extent to which it is legally conceivable that direct criminal liability will be imposed

[1] Yarmouk University, Jordan. E-mail: ajarmamonther@yahoo.com

on artificial intelligence entities, such that artificial intelligence is responsible for the crimes it commits, or is responsible for the crimes committed by entities associated with it, or its manufacturer is responsible, or the owner or another party bears the crime.

Questions of the Study

The Main Question: What are the provisions of criminal liability resulting from artificial intelligence errors?

Sub-Questions

What is the definition of criminal liability and what are its characteristics and corners?

What is meant by artificial intelligence?

What are the crimes generated by artificial intelligence?

Who are the penalties for artificial intelligence crimes?

Importance of the Study

The importance of this study lies in its focus on a new and vital topic, which is the criminal liability arising from artificial intelligence crimes in Jordanian legislation. Artificial intelligence has significant importance in many aspects, and it is not easy to encompass all of them. Indeed, we must acknowledge that artificial intelligence might be more capable even in scientific research and could play a key role in achieving more discoveries. Consequently, it will be an important factor in activating innovation across various fields, including criminal justice. Therefore, the significance of this study emerges from addressing this vital topic, which is increasingly gaining attention with the rapid developments in artificial intelligence and its various applications.

METHODOLOGY

Descriptive Analytical Method: This method will be adopted to analyze the relevant legal texts on the study topic, in addition to analyzing the jurisprudential opinions that the study will encounter, and describing the criminal liabilityarising from artificial intelligence crimes in Jordanian legislation.

Comparative Method: This method will be used to compare Jordanian legislation with other legislations that have regulated the criminal liability arising from artificial intelligence crimes, drawing upon them for assistance.

PREVIOUS STUDIES

Ben Aouda (2022) indicated that the use of robots and artificial intelligence programs in various sectors raises many difficulties, especially regarding liability for the actions of these programs and the adequacy of current legislation and its ability to accommodate the unique characteristics of this technology. Accordingly, this study seeks to discuss some current challenges of artificial intelligence, or those that may arise in the future, especially if artificial intelligence technology develops and is used on a wide scale. The aim of this study is to codify the situations of artificial intelligence crimes, to determine who is responsible for those crimes and to impose penalties on them. The importance of the topic lies in the fact that our current era does not lack artificial intelligence in any field, and with this widespread use, crimes related to it will increase. Therefore, it was necessary to research criminal responsibility for crimes committed through it, and to determine the real perpetrator so that the legal penalty can be applied to them.

Al-Mulla and Moath (2021) analyzed the historical dimensions of the theory of criminal liability and its application in the era of artificial intelligence. Criminal liability is one of the most important theories upon which criminal law is based. Its philosophy lies in attributing the crime to the responsible party and proving their deservingness of a deterrent punishment or preventive measure. Thanks to jurisprudential efforts, this theory has evolved over time. Initially, it was purely materialistic, extending to humans, animals, and inanimate objects, even extending to others to inflict punishment on them. Over time, it has taken on a personal and moral character, considering the natural person responsible for the crime they committed and their mental ability to comprehend their actions and bear the punishment.

Despite the jurisprudential debate about recognizing the criminal liability of legal persons, some criminal laws still do not accept relinquishing the accountability of natural persons in crimes committed by legal persons. The Fourth Industrial Revolution has brought criminal jurisprudence back into the arena of debate, as the various applications of artificial intelligence pose a new challenge to legal thought, especially criminal thought. Jurisprudence has raised a fundamental problem and question: Who is criminally responsible for crimes arising from those applications and intelligent devices, especially if they are committed autonomously, without human intervention? In other words, can the crime be attributed to the intelligent machine? Answering this question required using both historical and analytical methods.

The study reached several conclusions, the most important of which are that the development and widespread use of artificial intelligence applications without ethical and legal constraints pose a danger to the security and stability of societies. It also found that although significant progress has been made regarding intelligent machines, they still lack the psychological capacities that humans have, which qualify them for criminal responsibility. Another finding is that the prevailing jurisprudential opinion is that the liability of the intelligent machine should be attributed to the natural person. The general rules of criminal law and criminal liability are not suitable for dealing with the reality of crimes committed by intelligent machines. The study concluded with a recommendation to the Kuwaiti legislator, and Arab legislators in general, to recognize the legal personality of intelligent machines and to establish a punitive system compatible with the nature of intelligent machines.

The study is divided into two chapters:

Chapter One: The Nature of Criminal Liability for Artificial Intelligence

Chapter Two: Crimes Generated by Artificial Intelligence and Their Penalties

Chapter One

The Nature of Criminal Liability for Artificial Intelligence

With the rapid advancement of artificial intelligence technologies and their spread across various fields, questions arise about the criminal liability for criminal acts that may result from these technologies. Artificial intelligence, with its growing capabilities in learning, analysis, and independent decision-making, could lead to unforeseen damages and crimes.

In this chapter, the concept, characteristics, and elements of criminal liability will be clarified in the first requirement, followed by an explanation of the concept of artificial intelligence in the second requirement.

The First Requirement

The Concept, Characteristics, and Elements of Criminal Liability

Criminal liability is a type of legal liability arising from committing a legally prohibited act. It is characterized by several features that distinguish it from other types of legal responsibility. Criminal liability can be defined as the obligation of a person to bear the legally prescribed punishment as a result of committing a criminal act. This obligation arises from the presence of three essential elements of the crime: the material element, the moral element, and the legal element. Criminal liability is punitive, aiming to impose penalties on the person responsible for the crime. It is also universal, not limited to a specific group, but includes all individuals who commit crimes.

The Concept of Criminal Responsibility

Criminal responsibility refers to "the ability of an individual to bear the consequences of his actions and be held accountable for them. It also means that the person is obligated to bear responsibility for the crime he committed and is required to bear the punishment stipulated by law for this crime. It can also be defined as an obligation to bear the legal consequences and results that arise from proving all the elements of the crime, and these obligations are either a penalty or a precautionary measure determined by law for those who are proven to be involved in that crime."

It is "the right that a person has to bear the criminal penalty stipulated by law as a result of a crime he committed, whether this penalty is an actual penalty or a precautionary measure ."

It means that the person is obligated to bear the legal consequences of his actions if all the elements of the crime are present. This responsibility is applied by imposing a penalty or taking a precautionary measure under the law against the person responsible for the crime, as it is assumed that there is a crime and that all its elements are met for criminal responsibility to exist, whether it is a serious crime, misdemeanor or violation, and whether it was fully planned or executed suddenly. Therefore, responsibility is not part of the elements of the crime itself, but rather it is a result of the availability of all the elements of the crime ."

Characteristics of Criminal Responsibility in the Context of Artificial Intelligence

The characteristics of criminal responsibility in the context of artificial intelligence are as follows:

No Responsibility without a Crime: There must be a crime committed for criminal responsibility to arise.

Criminal Responsibility is Personal: Responsibility is attributed to the individual who committed the crime.

Criminal Responsibility Relates to Public Order: It concerns the public order and the enforcement of societal rules.

Criminal Responsibility Depends on Criminal Capacity: The individual must have the capacity to be held criminally responsible.

Exemptions from Criminal Responsibility Are Specifically Defined: There are specific and limited conditions under which an individual can be exempt from criminal responsibility.

Criminal Penalties Are Not Limited to Punishment: The penalties can include various forms of corrective measures beyond mere punishment.

Elements of Criminal

Responsibility

The Material Element of Criminal Responsibility

The material element in criminal responsibility, especially in the context of artificial intelligence, consists of several components:

Criminal Behavior

This refers to actions performed by the accused person that are punishable by law. This criminal behavior must manifest in an external act; as criminal law does not deal with intentions or bad motives unless they are manifested in an external action. Criminal behavior is one of the main components of the material element, encompassing all types of crimes, whether intentional or unintentional, complete or incomplete. The penal rule states that there is no crime without material behavior.

Criminal Result

This is the dangerous outcome that causes a change in the external world. The criminal result contains two intents: material intent and legal intent. Material intent refers to the physical result itself, such as loss of life, while legal intent refers to a threat to a legally protected interest.

Causal Relationship

There must be a causal link between the criminal behavior of the accused (in this case, the artificial intelligence) and the damage, crime, or danger (the criminal result). The existence of this causal relationship is necessary to prove the material element, thus the criminal behavior executed must be the actual cause of the harmful criminal result.

This structure highlights the critical need to understand how artificial intelligence integrates into the existing framework of criminal responsibility, ensuring that accountability and legal standards are appropriately maintained in the evolving technological landscape.

Section Two: The Moral Element in Criminal Liability

The moral element is the notion that, in accordance with jurisprudential, legislative, and judicial approval, the moral element or purposeful conduct must exist as a fundamental basis for imposing criminal culpability. It is not sufficient to demonstrate that the individual was responsible for the material component of the crime; rather, there needs to be evidence of a moral failing that can be placed on this individual or of a psychological connection between the material element and the offender.

In other words, the accused cannot be held accountable for a crime based only on evidence of contributing to the occurrence of the material element of the crime, but it must also be proven that he had bad intentions or a psychological link that links him to the material act he committed. This principle aims to ensure the justice of punishment and avoid unfairly accusing people of crimes they did not commit with bad intentions.

There must be additional factor pertaining to the accused person's psychological and spiritual qualities in addition to the material aspects of the crime. This component, referred to as the moral component, has to do with how the accused's outward actions correspond to his inner motivations and state. The moral component might be any of the two following types:

Criminal Intent

In this case, the perpetrator intends to carry out his criminal behavior and achieve the result associated with it, as the perpetrator has prior knowledge of the prohibited acts and the legal conditions related to them.

Intentional Fault

An intentional fault occurs when the perpetrator commits an act that contradicts the law without intending to achieve the prohibited result. This fault indicates a deviation of the perpetrator's behavior from that of an ordinary person in similar circumstances and facts. It can result from negligence, recklessness, or non-compliance with laws . When applied to artificial intelligence, if the fault arises due to the manufacturer's negligence in calibrating the robot's algorithms, or if a person is driving a self-driving car and a malfunction or change in the route occurs that the car cannot handle, resulting in a traffic accident, the moral element would be present due to an unintentional fault.

The Second Requirement

The Concept of Artificial Intelligence

According to the World Intellectual Property Organization (WIPO) on intellectual property and artificial intelligence, "Artificial intelligence is a field of computer science that aims to develop machines and systems capable of performing tasks that are considered to require human intelligence, whether with limited human intervention or without human intervention. For the purposes of this document, artificial intelligence generally equates to narrow artificial intelligence."

Some define artificial intelligence as "a part of computer science that aims to simulate cognitive abilities to replace humans in performing appropriate functions in a specific context, relying on intelligence, performing operations that depend on perception, thinking, and acting, and being able to store and use accumulated human experiences and knowledge in decision-making, thus having the ability to imagine, create, and understand visual matters."

It is also defined as "a branch of computer science that focuses on studying and creating computer systems that display some forms of intelligence. These systems can make very useful inferences about the problem at hand, understand natural languages, or perceive live perceptions, among other capabilities that require intelligence if performed by a human."

In its simplest definitions, artificial intelligence is the ability of a machine to simulate the human mind through designed computer programs. Artificial intelligence can be defined as a field concerned with developing systems and technologies capable of performing tasks considered intelligent in a way that resembles human behavior. Artificial intelligence aims to design and build systems capable of processing information, making decisions, and solving problems in a manner that approaches or matches human performance.

Some define artificial intelligence as "a part of computer science that aims to simulate a cognitive ability to replace humans in performing appropriate functions in a specific context based on intelligence, and to carry out operations that depend on perception, thinking and action, and can store accumulated human experiences and knowledge and use them in the decision-making process, and then the ability to imagine, create, understand and perceive visible matters ."

It is defined as "a type of branch of computer science that is concerned with studying and forming computer systems that show some forms of intelligence, and these systems have the ability to draw very useful conclusions about the problem at hand, and these systems can understand natural languages or understand living perception and other capabilities that require intelligence if implemented by humans ."

Artificial intelligence, in its simplest definition, is the ability of a machine to simulate the human mind through computer programs that are designed .

Artificial intelligence can be defined as a field concerned with developing systems and technologies that have the ability to perform tasks that are considered intelligent in a way that resembles human behavior. Artificial intelligence aims to design and build systems that are able to process information, make decisions, and solve problems in a way that resembles or approaches human performance .

When researchers talk about making machines behave like the machines in science fiction movies, this refers to the ambition to develop systems with superior capabilities that include self-learning, artificial thinking, communication, and intelligent interaction with the environment and humans. Although progress in these fields has achieved tangible results, there are still major challenges in achieving a level similar to the capabilities of the human mind .

Today's computer has the ability to process numbers and solve complex mathematical problems quickly and accurately. However, there are still other aspects of human intelligence such as communication, social interaction, creative thinking, and deep learning that are considered a challenge for artificial intelligence. The human brain consists of a complex network of millions of interconnected neurons, and researchers indicate that imitating this level of complexity is beyond the capabilities of humans currently.

Artificial intelligence is a science and a set of computational techniques that simulate the ways and means of using humans' nervous systems and bodies to sense, learn, and act. Although the development of artificial intelligence is still incomplete and cannot be predicted exactly, there has been remarkable progress in this field over the past sixty years.

Artificial intelligence is defined as a field of computing that aims to develop programs and systems capable of performing behavior similar to human intelligence. Artificial intelligence aims to enable computers to perform tasks that require human intelligence, such as logical reasoning and complex problem solving.

Chapter Two

Crimes Arising from Artificial Intelligence and Their Penalties

In the modern era, artificial intelligence has become increasingly prevalent in various fields of life. This technological advancement has become an integral part of contemporary society, used in diverse areas such as education, healthcare, and business. However, this technological development has not been without its risks and legal challenges, especially with the use of AI technologies. This has led to the emergence of new types of criminal behavior that differ from traditional crimes. Therefore, it has become imperative for legislators to address these crimes and stipulate appropriate penalties for them.

In this chapter, the crimes arising from artificial intelligence will be detailed in the first subsection, followed by the penalties associated with criminal responsibility for AI-induced crimes in the second subsection.

The First Requirement

Crimes Arising from Artificial Intelligence

This requirement will outline the crimes arising from artificial intelligence and highlight their most prominent forms.

Crimes Arising from the Actions of Robots

A robot, also known as a "robotic human," is a mechanically programmed device designed to perform various tasks and activities, either through direct human direction or via computer programs.

Despite the numerous benefits and features of robots, practical reality has shown the potential for crimes resulting from their actions. Autonomous lethal robots are among the examples, which can lead to criminal outcomes. The most common crimes resulting from robots include murder. Several incidents of killings by robots have occurred, and some notable cases will be highlighted. Additionally, we will discuss other crimes that may result from the actions of autonomous lethal robots:

First: The Case of Robert Williams in 1979, Robert Williams died after being struck by a robotic arm while climbing a shelf at the Ford factory in Michigan, USA. His family sued the robot manufacturer for negligent design and failing to warn operators of potential risks associated with the robot's operation. The court awarded $10 million in damages, later increased to $15 million, which the company paid to Williams' family.

Second: The Case of Wanda Holbrook This incident occurred at an auto parts factory where a robot killed a 57-year-old woman while she was monitoring and repairing robots. It was explained that the robots were placed in separate sections, but one of the robots managed to extend its arm and hit her head, causing her death.

Third: The Case of a Volkswagen Factory Worker in 2015, a 22-year-old worker was killed while preparing a robot as part of a work team. He sustained severe injuries when the robot grabbed him and crushed him against a metal plate, resulting in his death.

Crimes Arising from Self-Driving Cars and Drones

This technology has been expanding for over a decade, including features such as parking assistance systems and motion and direction control systems. Questions arise about the incidents leading to fatalities, as drones are used for both military and civilian purposes. Police reports confirm that the use of drones in criminal activities is on the rise.

The first license for a self-driving car was issued in Nevada, USA, in 2012. Subsequently, six other states allowed testing of these cars on their roads in 2015. Self-driving cars have also been tested in several European countries such as the UK, France, Germany, Spain, and the Netherlands in the same year.

A significant shift towards reliance on self-driving cars is expected shortly. Tessla has developed an autopilot feature, and Google is also working on developing self-driving cars. There are rumors that Apple is working on a self-driving car, which may be launched between 2023 and 2025.

On March 18, 2018, a woman named Elaine Herzberg was hit by a self-driving car operated by Uber. The car was in self-driving mode with a human driver in the front seat. At that moment, the car failed to recognize Elaine's movement and hit her. She was taken to the hospital but later died from her injuries. Elaine was the first victim of an accident involving a self-driving car. Other similar incidents have occurred, such as a smart Tesla car crashing into a white truck under the influence of bright sunlight.

In addition, traffic violations may occur as a result of the operations of self-driving cars. Therefore, it should not be ruled out that there may be involuntary manslaughter or other crimes as a result of the operations of self-driving cars, and we must recognize that the technology is still being developed and tested, and it is

important to learn from these incidents and work to improve systems and enhance safety to ensure the highest levels of protection and safety in the field of self-driving cars.

Among the known criminal crimes committed by self-driving cars, occurred in March 2018 when a woman named Herz Burg was hit by a self-driving car operated by Uber, resulting in her death due to the injuries she sustained. This was the first recorded death of a pedestrian due to a collision with a self-driving car. The accident occurred late in the evening of March 18, 2018, when the woman was crossing Mia Avenue from the west side to the east side outside the designated crosswalk near the highway. She was riding a bicycle and carrying shopping bags and crossed several lanes of traffic before she was struck by an Uber Volvo XC90 that was operating autonomously. The backup driver did not intervene for the lady's safety.

Crimes resulting from the work of remotely operated drones

In the military field, some countries such as the United States, China, Israel, South Korea, Russia, Australia, India, and the United Kingdom are allocating billions of dollars to develop war technology that uses artificial intelligence, and the use of autonomous weapons and programming these systems to make individual decisions using facial recognition technology. The danger lies in the fact that the machine is allowed to make decisions on matters of life and death, without human intervention except in the first stage, and governments and companies are developing drones and other advanced weapons that have the ability to choose their own targets and attack them without human control, in the event that the use of these killer robots is generalized in the military field, we will enter a dangerous phase; Machines do not care about any ethical considerations such as empathy and understanding, and make decisions based on blind algorithmic processes. Although they are programmed by humans, in practice, applications often achieve technology in facial and voice recognition, for example, they may not recognize women, children, and people with disabilities. The chances of errors in use far exceed what happened in some battles under the name of killing by friendly fire. Because there are fatal errors for these robots, the most prominent of which is that when they choose a target, it is not clear whether they are able to distinguish between enemy soldiers and children playing with toy guns or between civilians fleeing the conflict site and rebels making a tactical retreat. These autonomous weapons do not know that they are making a mistake, unlike soldiers who can intervene to stop mistakes. This means that lethal autonomous weapons can never be fully programmed to replace human decision-making.

The European Aviation Safety Agency defined it as individual system elements consisting of the UAV, the control station, other necessary system elements, command and control links, and launch and return elements.

NATO defined it as: "An aircraft that does not carry a human element, capable of flying under remote control or autonomous flight programming, may be recoverable or expendable, and may carry a lethal or non-lethal payload, rotary or fixed-wing."

The US Department of Defense defined it as a powered "aircraft" that does not carry a human element, can be operated remotely, may carry a lethal or non-lethal payload, and machines without a pilot, which is the basic part and component of systems without a "pilot." There are those who expanded the definition, such as the Federal Aviation Administration (FAA), the UAV as "a device used for flying without a pilot on board, and includes all categories of aircraft, helicopters and balloons that do not carry a pilot on board.

Some Arab legislations have addressed the definition of drones. UAE Law No. (4) of 2020 regulating drones in the Emirate of Dubai defines drones as aircraft flying in the air without a pilot on board, including aircraft piloted by the naked eye, remotely piloted aircraft, and self-piloted aircraft.

For example, in December 2018, Heathrow Airport in London was closed for 36 hours due to drones, a thousand flights were cancelled, and more than 120,000 people were affected, causing financial losses estimated at about 20 million pounds. In addition, Dubai International Airport was closed three times in 2016 due to drones, causing economic losses as a result of flight delays ranging from half an hour to an hour and a half.

Therefore, despite technological progress, drones must be used with caution and organization to reduce risks and ensure the safety of individuals and the safety of air transport. The first time the idea of drones appeared was in wars and armed conflicts, for the purpose of conducting surveillance and reconnaissance operations.

The first practical experiments were in England in 1917, and the first practical use of them was in the Vietnam War, and they were used in the October War of 1973.

Despite the advantages of drones and the benefits they achieve, the risks and crimes resulting from them have become more than enough to compete with the benefits, especially in the military field, where reliance on drones in armed conflicts has become within reach for most countries witnessing armed conflicts, including Yemen, for example, where a group was able to target Aramco deep in Saudi territory with drones, causing huge losses that stopped the company from working and affected global oil production by a decrease of about 6%.

We also remember what happened in Syria when the US-led international coalition forces carried out military strikes with the aim of eliminating ISIS, as American drones dropped three bombs on a large gathering of people in the village of Baghouz, east of Deir Ezzor Governorate, in March 2019, killing 80 people, most of whom were later found to be civilians, according to an investigation by the New York Times on October 13, 2022. Local sources estimated that the number of victims exceeded 400 civilians and members of the organization, and the number, according to what Al Jazeera reported, is estimated at about three thousand people who were killed by the coalition forces and the Syrian Democratic Forces militia, as it published shocking images of the bodies of women, children and the elderly in the streets. Accordingly, the massive expansion in the technologies used in drones requires a new legal framework as it represents a real challenge to international law.

The second Requirement

Penalties Associated with Criminal Responsibility for AI-Induced Crimes

The use of artificial intelligence spans numerous fields, from e-commerce and healthcare to self-driving cars and financial analysis. As human reliance on these technologies increases, so does the risk of errors or violations related to AI. Many legal and ethical questions arise concerning the responsibility for these violations, particularly criminal liability. Who is responsible for the potential damages that can occur due to AI behavior? Do developers bear full legal responsibility, or do users share part of it? What penalties are imposed on individuals or companies responsible for AI-related violations?

This Requirement will outline these penalties and on whom they fall through two branches.

Penalties Imposed on the Manufacturer

The manufacturer of AI technology is the primary entity contributing to its creation and is thus the primary controller in programming and planning its operating systems. These systems must meet specific standards ensuring safety and security in case of loss of control. The rapid development of AI might lead it to a high level of autonomy in decision-making in the near future. Consequently, the manufacturer would bear criminal responsibility. Legislations should be established requiring manufacturers to adhere to standards in creating these technologies and imposing penalties for non-compliance. These penalties should correspond to the severity of the crime committed by the technology due to the manufacturer's negligence in adhering to established regulations.

Penalties Imposed on the Owner, User, or an Involved Third Party

The owner or user of AI technology enjoys its benefits and has a direct relationship with it. They may misuse it for personal gain, resulting in criminal behavior punishable by law. The owner or user's behavior can manifest in two forms:

1. Crimes arising from the owner or user's behavior: The criminal act's existence depends on the behavior of the owner or user. In this case, they bear full criminal responsibility, and penalties are imposed on them.

2. Crimes resulting from the joint behavior of the owner or user and a third party: Here, the responsibility is shared, and consequently, the penalty is shared.

CONCLUSION

The spread of AI technologies across all fields of life and their competition with humans in performing tasks once exclusive to human intelligence—such as understanding natural language, automatic word and face recognition, speech production, intelligent image editing, and autonomous driving—indicates that we are surrounded by smart machines acting autonomously in ways that mimic human behavior. This necessitates regulating these technologies through legal texts, especially when their actions exceed legal boundaries, thereby establishing elements of legal responsibility, particularly criminal responsibility.

For Jordan, one of the countries now required to adapt its legislative framework to this intelligent technological revolution, the applications of AI adopted by police systems in the traffic safety program, using video surveillance and automatic image analysis, are clear indicators that we are entering the era of smart cities. This demands the preparation of suitable legal texts for this situation, particularly in the field of AI crimes, and defining the rules governing criminal responsibility in this context.

From this, the following key findings and recommendations can be drawn:

The Results of the Study

The study revealed that assigning criminal responsibility in these incidents poses significant challenges, particularly in determining the criminally liable party (manufacturer, software developer, owner, user, etc.) based on the circumstances of each incident.

There is no legal framework in Jordan regulating criminal responsibility for AI crimes.

Recommendations

Establish clear criteria for determining criminal responsibility in each case, considering the roles of the manufacturer, software developer, owner, and user.

Legislators should take the necessary steps to create legislation regulating AI technologies and their exploitation to benefit both the state and its citizens. This legislation would ensure the optimal use of AI capabilities in various fields to serve the public interest, considering the ethical and legal aspects associated with its use.

REFERENCES

Arabic references:
Dr. Samir Alia, Explanation of the Penal Code, General Section, Majd University Foundation for Studies, Beirut, 2002.
Mahmoud Naguib Hosni, General Theory of Criminal Intent, Dar Al Nahda Al Arabiya, Cairo, 1978.
Dr. Mustafa Al-Awji, General Criminal Law, Criminal Liability, 2nd ed., Vol. 2, Dar Noufel, Beirut, 1992.
Nisreen Awad Allah Muhammad Al-Imam, The Nature of Criminal Liability and Its Elements, a research requirement to complete the PhD in Law, Faculty of Law, Mansoura University, Egypt, 1441 AH / 2020 AD.
Luqman Bamo, Criminal Liability of the Legal Person for the Crime of Environmental Pollution, a thesis submitted to obtain a Master's degree in Law, Faculty of Law and Political Science, University of Kasdi Merbah, Algeria, 2011/2010.
Moataz Hamdallah Abu Suwailem Criminal Responsibility for Occupied Crimes Master's Thesis Submitted in Completion of a Master's Degree, Faculty of Law, Middle East University, 2014.
Omar Muhammad Munib Idlebi Criminal Responsibility Resulting from the Acts of Artificial Intelligence, Thesis in Completion of the Requirements of the College of Law for a Master's Degree, Faculty of Law, Qatar University, Qatar, 2023.
Abdul Rahman Tawfiq Ahmed, Lectures on the General Provisions of the Penal Code, Vol. 2, 1st ed., Wael Publishing House, Jordan 2006.
Abdullah Ahmed Matar Al-Falasi, Criminal Responsibility Resulting from Artificial Intelligence Errors, Legal Journal, Faculty of Law, Khartoum Branch, Egypt, 2021, Issue 2863.
World Intellectual Property Organization WIPO Conversation on Intellectual Property and Artificial Intelligence, Second Session 11/05/2020.
Dr. Fatima Zahra Belhamou, Contribution of Expert Systems to Improving Decision-Making in Institutions Volume (2), Issue (1) Abu Bakr Belkaid University, Algeria, 2017.
Sheikh Hajira, Artificial Intelligence in Electronic Customer Relationship Management for the Algerian Popular Imposition CPA Academic Journal of Social and Human Studies, Hassiba Ben Bouali University, Chlef, Algeria 2018.
Adel Abdel Nour, Introduction to the World of Artificial Intelligence, King Abdulaziz University Publications, 2005.

Ziad Abdel Karim Al-Qadi, Introduction to Artificial Intelligence, First Edition, Safaa House for Printing, Publishing and Distribution, 2010.

Abdel Razzaq Wahba Sayed Ahmed Mohamed, Civil Liability for Artificial Intelligence Damages "An Analytical Study", Journal of Generation of Legal Research, Generation of Legal Research Center, Lebanon, 2020, Issue 43.

Robots in the Dock.. 5 Victims Killed by Machines, the Last of Them an Uber Girl, an article published online, available at the link: https://alwan.elwatannews.com, accessed on: 7\4\2024.

Lawsuit: A defective robot killed a factory worker, and blamed human error, available at, https://www.freep.com/ 2022/9/20 Date of visit: 6\4\2024.

Yahya Dahshan, Criminal Liability for Artificial Intelligence Crimes, Sharia and Law Magazine, United Arab Emirates, Vol. 34, No. 82, 2020.

Today's Cars Are Not Like Today... Discover the Coming Change in the World of Cars, an article published online, available through the link: https://www.snabusiness.com Accessed on: 7\4\2024.

See: Sayed Mohammed, Self-driving Uber car kills woman in Arizona, March 20, 2018, article published on the website: Available on, https://tech-echo.com/2018/03/self-driving-uber-car-kills-arizonapedestrian/. 22- Asmaa Mohamed El-Sayed, Artificial Intelligence Applications and the Future of Educational Technology - PhD Thesis, Faculty of Education, Minia University, 2020, p. 120.

See Article (2) - Definition - of Law No. (4) of 2020, issued in Dubai on June 25, 2020 - Official Gazette of the Government of Dubai Year 54, Issue (479) on July 7, 2020.

Hadid, Hassan Mohamed Saleh, Drones as a Means of Transportation in Law, Tikrit University Journal of Legal Sciences, Iraq, Issue 25, Year 2015.

The View Contribution of Unmanned Aerial Vehicles (UAVs) to the Oil and Gas Industry April 30 2019 by Airborne Drones Published on the Website.

Mishaal Masoud Al-Qaidi, Criminal Liability of Artificial Intelligence, a research submitted as part of the requirements of the Graduation Project Course (Law) in the Bachelor of Laws Program, Taibah University, Kingdom of Saudi Arabia, 1442/1441 AH.

Sarah Amjad Abdel Hadi Atmezi, Artificial Intelligence in the Light of Criminal Law, Master's Thesis, Hebron University, Jerusalem, Palestine, 1443 AH, 2022.

Foreign References

The Civilian Casualty Files, Hidden Pentagon Records Reveal Patterns of Fallure in Deadly Airstrikes, available on.

DAVID KRAVETS, Jan. 25, 1979: Robot Kills Human, Available on https://www.wired.com/2022/9/20

AARIAN MARSHALLAND DAVIES ALEX UBER, SELFDRIVING CAR SAW THE WOMAN IT REPORT SAYS, WIRED.COM, 18.3. 2018.ON LINE: DAVIES. KILLED

HTTPS://WWW.WIRED.COM/STORY/UBER.SELF.DRIVINGCRAS HARIZONANTSBREPORT/.

European Aviation Safety Agency, Air Worthiness Certifi cation of Unmanned Aircraft (MAS), 2009.

Alexandra, Suzanne, Cibb., Droning the story, thesis submitted in partial fulfillment of the requirements for degree of Master in journalism, University of British Columbia (Vancouvet). April, 2013.

Mathew, Degarmo, Issues concerning integration of unmanned aerial vehiclesn .civil Airspace, MITRE: Novembre, 2004.