

Civil Responsibility for Damage Resulted from the use of Artificial Intelligence Devices According to Jordanian Civil Law

A comparative study

Dr. Ahmad Abdul Karim Mousa Al-Sarayrah

Professor of Civil Law

Ajloun National University

Email :A.sarayrah@aun.edu.jo

Abstract

Aim: The current study aims to explain the legal base of artificial intelligence and is it one of the material things that needs a special care, explain Jordanian legislator's position on artificial intelligence, study the possibility of applying the traditional civil responsibility provisions in Jordanian civil legislation on damages resulted from the use of artificial intelligence devices and reach legal solutions to fill the gap of escape from responsibility due to the difficulty of proving the damages of artificial intelligence through objective responsibility.

Implications: The study dealt with defining artificial intelligence systems and their characteristics as they are material things and can be learnt, and they work by algorithms and others, then the provisions of civil responsibility for damages resulted from the use of artificial intelligence devices and they depend on objective responsibility, as it is legal based is the assumed error, and what Jordanian legislator has adopted as he made damage (harmful action) is the major pillar in the civil responsibility as the Article (256) stated on, and application of the Article (291) of Jordanian Civil Law as artificial intelligence devices require special care and their owner is considered a keeper since he owns the actual authority on them, and he directs them even if the user is one of the employees who is under his commands because they generate a financial return for him.

Method: The researcher adopted the descriptive and analytical method to describe legal texts organizing the provisions of civil responsibility in the Jordanian Civil Law and the extent of providing legal protection to applications of artificial intelligence.

Results: The study reached a set of results, the most important of which are: artificial intelligence devices can be defined as they are serious material things that need special care with special nature that perform acts and tasks similar to human intelligence and abilities, legal jurisprudence disagreed about granting artificial intelligence a legal personality, and the most correct opinion is granting super smart applications a restricted legal personality gives them a set of benefits and rights and Jordanian government direction to issue National Code of Ethics for artificial intelligence is considered a first step in legal organization aspect of artificial intelligence in Jordan.

Keywords: artificial intelligence, objective responsibility, assumed error, damage, causation, compensation

Introduction

Artificial intelligence is the result of industrial development and technological progress, and the use of its application became widespread all over the world rapidly, as humans became dependent on artificial intelligence devices and use them in all aspects of life, which is reflected today on the nature of humans life and has become blessed with luxury and speed in completing many tasks and the accuracy of their mastery. Artificial applications proved their efficiency in many fields; they are used in the medical field through helping doctors in surgery, evaluating the patient condition and helping in discovery of diseases. They also entered industrial field like self-driving cars, in the military field through drones and robots used in fighting operations, in battles and wars effectively. Artificial intelligence has a clear impact in the field of social media field such as saving effort to users of artificial intelligence, researchers and specialized scientists in all aspects, as it enables them to obtain accurate and confident information.

Law is also in a race against the digital revolution through artificial intelligence and innovations, so lawmen and legislators must be ready to find solutions to problems resulted from these developed devices through legal organization, providing innovators with legal protection and treating damages to humans,

properties or environment resulted from them; artificial intelligence is a double-edged sword, as it provides welfare and produces harm, where a harmed person should be compensated. Artificial intelligence reveals very big and various problems, so legal jurisprudence should find solutions to its all problems, and treat the difficulty of applying civil responsibility provisions in their classical to face damages resulted from artificial intelligence applications, where these applications are still under development, which requires inevitability of issuing special legislation to artificial intelligence applications, so this study will be divided into two topics; the first topic will deal with the concept of artificial intelligence and the characteristics of its systems, and the second topic will deal with provisions civil responsibility resulted from damages caused by artificial intelligence devices.

Study problem

The study problem lies in the adequacy of civil responsibility provisions to face damages resulted from the use of artificial intelligence devices through answering the following:

- What is the legal base for responsibility resulted from damages of artificial intelligence?
- Is there a need to issue Jordanian legislation specialized in artificial intelligence includes provisions that treat civil responsibility for damages of artificial intelligence devices that can be resorted to before referring to public provisions in Jordanian Civil Law?
- How can damage resulted from artificial intelligence be proven which affects the amount of compensation due to it?

- Is it possible to determine who is responsible for the damage resulted from artificial intelligence?

Study questions

The current study addresses the following several questions:

- What is the concept of artificial intelligence and what are its types?
- Can artificial intelligence have legal personality?
- What is the legal base of artificial intelligence?
- Is it possible to hold artificial intelligence itself accountable for the damage it causes?
- How compensation can be assessed for damage resulted from artificial intelligence?
- What are the essential legal solutions to face damages resulted from artificial intelligence?
- Is the contractual responsibility arising from artificial intelligence damages considered a responsibility to exercise care or achieve an end?
- Is the contractual responsibility arising from artificial intelligence damages considered a responsibility to give care or achieve an end?
- Is it sufficient to adopt the habitual person standard of giving the required care to apply tort responsibility provisions to damages resulted from artificial intelligence?

Importance of the study

The importance of the study lies in shedding light on uses of artificial intelligence devices in all aspects of life and the several resulted damages, which requires defining the concept of artificial intelligence and its areas of use, since they contribute in the possibility of facing those damages resulted from it according to civil responsibility provisions, and the attempt to deduce the possible solutions in order to activate civil responsibility provisions to face artificial intelligence provisions.

Study objectives

The study aims to:

- Explain the legal base of artificial intelligence and is it one of the material things that needs a special care.
- Explain Jordanian legislator's position on artificial intelligence.
- Study the possibility of applying the traditional civil responsibility provisions in Jordanian civil legislation on damages resulted from the use of artificial intelligence devices.
- Reach legal solutions to fill the gap of escape from responsibility due to the difficulty of proving the damages of artificial intelligence through objective responsibility.

Study limits

The study will be limited to explaining the provisions of civil responsibility resulted from damage of artificial intelligence devices, and therefore the limits of the study will be within the provisions of the Jordanian Civil Law.

Study methodology

The researcher treats within the framework of the descriptive and analytical method the description of legal texts organizing the provisions of civil responsibility in the Jordanian Civil Law and the extent of providing legal protection to applications of artificial intelligence, according to the provisions of the Jordanian Civil Law, in addition to review what legal jurisprudence has dealt with about this.

First topic

Definition of artificial intelligence and its characteristics

Systems of artificial intelligence are one of the most advanced technological innovations in our current era, and they are facts that have very clever applications similar to human intelligence; as the pace of technology in modern industries is accelerating in order to serve humans and their well-being, and as a result, artificial intelligence devices appeared and its developed systems, where their use is increasing greatly in various aspects of civil and military life, and we can say that they became a major part in all human uses. Economic institutions and banks use artificial intelligence devices (robots) as highly intelligent mechanisms. As a result of this usage, errors appear which resulted in damages whether to humans or properties. In order to define responsibility to reach a fair compensation, it is necessary to study the concept of artificial intelligence in the first requirement, and the characteristics of artificial intelligence devices in the second one.

First requirement

Concept of artificial intelligence

Concept of artificial intelligence is a modern and technical science ¹ , resulted from technological development in the world, and is characterized by its rapid spread, as many definitions for artificial intelligence appeared by jurists and world organization that paid attention to this scientist to reach a standard definition and a legal system that determine civil responsibility for damages resulted from its use.

At the level of civil legislations, they did not set a comprehensive definitions to this concept² because of its privacy, but western legislations paid more attention to this concept, as we find the USA suggested the project of artificial intelligence law which included a definition to it “Every made systems that perform their task under varied and unexpected conditions without much human supervision, or they are able to learn from their experiments and develop their performance, and it is possible to develop in computer programs, material devices or other contexts that have not been thought of yet to enable those systems to solve tasks that require similar realization to human, planning, learning or reach and physical labor ³ .

While in France the National Advisory Committee on Ethics in France defined Artificial intelligence as “A combination of information programs dedicated to carrying out tasks that humans accomplish more satisfactorily at the present time, because they require high-level practical processes such as cognitive learning, memory organization, and critical thinking, then those operations assume cognitive abilities that allow him to achieve objectives independently”⁴ .

¹Dr. Salam Abdullah Karim, Legal Regulation of Artificial Intelligence, a comparative study, PhD thesis submitted to the Council of the College of Law, University of Karbala, Iraq, University of Karbala, October 2022, p. 9. It will be referred to later as Dr. Salam, Karim. The previous reference.

²Dr. Salam, Karim. The previous reference, p10

³ Dr. Salam, Karim. The previous reference, p 11.

⁴ Rapport de synthèse sur les états généraux de la bioéthique 2018, Comité consultatif national d'éthique, glossaire, p.110 : ((Construction de programmes informatiques qui s'adonnent à des tâches qui sont, pour l'instant, accomplies de façon plus satisfaisante par des êtres humains car

Throughout deducing the French definition, it's found that it linked artificial intelligence with cognitive learning, as cognition is a basic requirement for the establishment of civil responsibility, in legislations that require proving error as a pillar of civil responsibility, it is necessary to have recognition , organizing memory and critical thinking, where these are characteristics of human, and this what distinguishes a traditional machine from a smart one, since the latter is able to learn from human and performs the same tasks ⁵ .

A part of jurisprudence criticized this definition as it did not take into consideration future development that artificial intelligence will outperform humans ⁶. As for EU, the European group suggested a definition to artificial intelligence as “a group of systems created by humans working through the complicated goal in the physical world or virtual digital one through realization of their environment, interpretation of collected data in their industrial mind whether they are systemized or not, and think logically in cognition taken from these data and define the best procedures required to be taken according to previous certain standards to achieve the certain goal” ⁷.

Through deducing the European group definition, it's found that it gathers between the technical and legal aspects concerning dealing with smart systems completely, as it is considered a comprehensive concept.

The European group also established a technical body called “the unit of robots and artificial intelligence” as its mission is to develop technology in the field of

elles demandent des processus mentaux de haut niveau tels que : l'apprentissage perceptuel l'organisation de la mémoire et le raisonnement critique))

⁵Dr. Salam Kareem, previous reference, p11.

⁶ See Dr. Christian Yusuf , civil responsibility for artificial intelligence action, MA thesis, introduced to the Council of Law and Political Sciences, Lebanese University 2019-2020, p 20.

⁷ Proposal for a ((REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL LAYING DOWN HARMONISED RULES ON ARTIFICIAL INTELLIGENCE (ARTIFICIAL INTELLIGENCE ACT) AND AMENDING CERTAIN UNION, Brussels, 2021,p8.

smart robots, and artificial intelligence is included in various fields of engineering and medical sciences, and in drones, etc. ⁸ .

The definition also takes into consideration the need to find a balance between innovation on the one hand, and ensures sufficient protection to the society from the dangers of artificial intelligence on the other hand specially in the field of high dangers applications within clear legal frameworks ⁹ .

The committee also confirmed in the definition that it is necessary to define the extent to be applied in addition to focus on assessing expected dangers for the use of artificial intelligence ¹⁰ . While at the level of Arab legislations, the Jordanian , Egyptian, Iraqi and the rest of Arab countries legislators did not define artificial intelligence although the Council of Ministers in Jordan approved the national strategy of artificial intelligence, and agreed on its uses.

The legal formulas that the jurists have dealt with also differed when defining artificial intelligence since it is a compound idiom, where Webster dictionary defined it as “The ability to understand conditions or new or changed situations, i.e. the ability to realize, understand and learn situations or new circumstances, which means that the key of intelligence are realization, understanding and learning”¹¹ .

A for the meaning of the word “artificial”, it is applied to everything caused by an activity or action for the purpose of manufacturing, as it includes material and

⁸ Oxford Dictionaries, “Artificial Intelligence” (en. oxford dictionaries .com/definition /artificial intelligence) , 27 / 1/ 2021 ,p5.

⁹ Dr. Salam Karim, previous reference, p14.

¹⁰ An article entitled “Artificial intelligence in EU: Balance between advantage” at [https://ar.eureporter.co/frontpage/2021/01/01/ai-in-the-eu-balancing /](https://ar.eureporter.co/frontpage/2021/01/01/ai-in-the-eu-balancing/)

¹¹ Caferra Ricardo: Logique pour l’informaticque et pour l’intelligence artificielle Hermes Sciences Publication, Paris, France, 2011, p 20.

moral things by human distinguished from natural things actually presented without human interference ¹².

On this basis it can be said that artificial intelligence in general is “intelligence that humans set or made in a smart machine or a computer, or intelligence issued by human originally then he granted it to a machine or computer” ¹³.

Others also defined artificial intelligence as “Science through which it is goal I is known which made machines (computer systems) do things that need humans intelligence” ¹⁴. See

While Robert Pocket Dictionary defined artificial intelligence as “a part of a computer aims to simulate the ability of human beings to perform appropriate functions in a specific context that require intelligence ¹⁵, and it was also defined as “This science which is interested in making smart machines behaved as what it is expected from humans to behave in doing their tasks, where it deals with the following fields ¹⁶:

1. Natural language. 2. Robot. 3. Identify words. 4. Artificial networks. 5. Expert systems.

Some defined it as “a mean to create a computer device, or a robot which can be controlled by a computer or a program that thinks intelligently in the same way that intelligent humans think in order to achieve artificial intelligence through

¹² See Sahar Abdel Sattar Imam, Reflections of digital era on values and traditions of jurisprudence, Egyptian Journal for Legal and Economic Studies, Issue 10, Egypt, p22, and it will be referred to as Sahar Imam, previous reference.

¹³ Dr. Salam Karim, previous reference, p 17

¹⁴ Dr. Salam Karim, previous reference, p 17

¹⁵ See : Quoted from: Dr. Yassin Saa'd Ghaleb, Basics of Administrative Information Systems and Information Technology, 1st edition, Dar Al-Manahij for Publishing and Distribution, Amman, Jordan, 2011, p. 23, and it will be referred to as Dr. Yassin Ghaleb, previous reference

¹⁶ Thagard P, Computational philosophy of science, The MIT Press, Edition, London, England , 1998 , p 20

studying how humans mind thinks, how they decide and teach while attempting to solve a problem , then use the study results to develop smart programs and systems”¹⁷.

The researcher thinks that artificial intelligence can be defined as “one of a computer sections that works according to accurate and developed computer programs which are able to stimulate an intelligence person which enables a robot to do and implement its tasks as an intelligent person does through cognitive learning and understanding to reach the same result that humans want and without errors”.

The researcher thinks that this smart machine and its cognitive learning are considered a material one, and if damage occurs resulted from its use, this damage resulted from the error is considered assumed from a legal aspect, which is similar to damages resulted from things.

Second requirement

Characteristics of artificial intelligence systems devices

Artificial intelligence devices have characteristics that distinguished them from others related to their intangible nature and functional exploitation, they are not subject to complete control and their reactions are completely unpredictable. Based on this, characteristics of systems artificial intelligence devices can be summarized as follows:

First: Physical character of artificial intelligence system

¹⁷ Dr. Yahia, Ibrahim Dahshan, Criminal responsibility of artificial intelligence, Journal of Sharia and Law, Faculty of Law, UAS University, 2019, p14, It will be referred to as Yahai Dahshan, previous reference.

Artificial intelligence systems are characterized by the fact that they are tangible substances that arise from a set of algorithms or software, which most comparative legislation considers being intangible assets and actions of the mind and thought subject to intellectual property laws, as the artificial intelligence system appears in a material physical body driven by algorithms or software that form invisible mind for it as soon as they are integrated and connected to it ¹⁸.

Second: Functional independence of artificial intelligence systems

Artificial intelligence systems are characterized by the fact that they are automated i.e. they are programmed certain period and period, which means that are run on pre-prepared programs, but artificial intelligence systems are in rapid and continuous development making them simulate cognitive operations related to human intelligence and involve in several aspects of life, and as a result of this, their functional reaction cannot be known previously if they work in a way that exceed the limits of human intelligence in independency, speed and accuracy ¹⁹.

Artificial intelligence systems have no known certain expected reactions continuously since they include cognitive intelligence self-learning systems, and they are previously programmed according to surrounded circumstances, as they take their decision independently through data and experiences which they are encrypted and programmed inside systems without referring to those who entered them whether they are makers or programmers.

¹⁸nour elkaakour.L'intelligence artificielle et la responsabilité civile de l'ictuelle,Me'moire pour.l'obtention du Diplôme d'Etudes Approfondies EnDroit Inteme et International des. Affaires"université LiBANISE Faculte' de droit et des sciences poiti ques et ADministratives file're francophone. 20177. P03ET24.

¹⁹ Dr.. Mustafa Abu Mandour Musa Issa. The adequacy of the general rules of civil liability in compensating for artificial intelligence damages. A comparative analytical study. Damietta Law Journal for Legal and Economic Studies, Egypt. Damietta. Fifth issue, January 2022, pp. 242-243, and it will be referred to as Dr. Mustafa Abu Mandour. Previous reference

Third: The difficulty of quantifying the actions of artificial intelligence systems and their unpredictability

There are situations where it is difficult to understand harm actions caused by artificial intelligence systems and know their causes in occurring damage since they cannot be seen because some artificial intelligence theories actions may result in tangible material impact and it is invisible ²⁰.

Fourth: Lack of temporal and spatial restriction of artificial intelligence systems

Artificial intelligence systems are characterized by their materiality and they are independent in their function, and their reaction cannot be predicted, where they are characterized by the fact that they are not concentrated in a specific place and time. They are absolute and can be used by a person at any time and in any place, and this results in the lack of specificity of time and place of damage caused by their use, which leads to a legal difficulty in defining spatial specialization of the dedicated court to decide on a claim for compensation for damage caused by artificial intelligence machine, and the law that should be applied in this case ²¹.

Fifth: Symbolic representation

Artificial intelligence uses digital symbols because smart applications deal with symbols express available information²² , not that a computer cannot distinguish the intentioned meaning of words as humans can do²³.

²⁰ Adrien Bonnet, LaResponsabilite' du Fait de Lintelligence artificielle Me'moire de recherche droit prive' ge'ne'ral, universite' panthe'on, parisii, 2011-2015 ,p11.

²¹ Dr. Mustsfa Abu Mandour, previous reference, p257 - Determination of importance for comprehensive topographic factors on landslide hazard mapping using artificial neural network MS Alkhasawneh, UK Ngah, LT Tay, NAM Isa Environmental earth sciences 72, 787-799

²² Dr. Salam Karim, Thesis, p 22.

Sixth: Embrace knowledge

In order that the robot of artificial intelligence in a computer is able to do its tasks, it is necessary to provide it with information and make it understand them, since some of artificial intelligence characteristics are symbolic representation to express information ²⁴, artificial intelligence devices also use special structures to describe cognition and ensure facts and relations between them and laws which link these relations.

Artificial intelligence devices include the base of cognition which is cognitive structures, and this base provides efficient information about a problem to be solved²⁵.

Seventh: Ability to learn

Artificial intelligence systems have the ability to learn through previous experiences and practices, and this is connected to the ability to generalize and deduct information with ignoring some of them since it is redundant and has no advantage. Artificial intelligence software has the ability to store information and forget it unlike humans, who are naturally forgetful ²⁶, and cannot be matched with human intelligence although it has the ability to change its actions because of his

²³Dr.. Salah al-Din Othman Mahdi, using expert systems as an introduction for developing the performance of the external auditor. Doctoral thesis in business administration. Amman Arab University, Jordan, Amman, p. 18
Mutaseem Shabeb Alkhasawneh, "Software Defect Prediction through Neural Network and Feature Selections", *Applied Computational Intelligence and Soft Computing*, vol. 2022, Article ID 2581832, 16 pages, 2022. <https://doi.org/10.1155/2022/2581832>

²⁴ Salam Karim, previous reference, p 18.

²⁵ Dr. Suleiman Al Mubarak bi Saeed. Introduction to the organization of experience and the steps of its design. Scientific symposium on expert systems for fighting fires in construction. Naif Arab University for Science and Security, Riyadh, Saudi Arabia. 2010, p. 27.

²⁶ Dr. Bashir Arnous. Artificial intelligence. Dar Al-Sahab for Publishing and Distribution. Cairo, Egypt 2007, p11.

experience, and it is not connected to original actions where it was programmed according to them ²⁷.

Eighth: Their ability to deal with incomplete information

Artificial intelligence systems have the ability to find solutions although the information stored is incomplete, because it's required to find a solution from this information, but results may be less factual or incorrect with a possibility of their error ²⁸.

Second topic

Provisions of civil responsibility of damages resulted from the use of artificial intelligence systems

As a result of artificial intelligence devices and their applications and their rapid spread and use by humans in all industrial and medical aspects of life and others, and its widespread use by all countries of the world specially in the field of advanced industries such as self-driving cars and aircraft, in surgical operations, and in counterfeiting operations, it must result in damage to people or properties and cause serious losses in souls and properties. In order to determine civil responsibility for damage resulted from the use of artificial intelligence devices and their applications and access to fair compensation that the harmed person must obtain, it is necessary to have legal adaptation to the nature of artificial intelligence devices and their applications and extent to consider them material things that require special care which will be dealt with in the first requirement, then we will deal with legal adaptation to the nature of artificial intelligence

²⁷ Salam Karim, previous reference, p 23.

²⁸ Dr. Nassif Omar Abdel Hilal. Using artificial intelligence systems as a tool for excellence in quality and competitiveness. A field study in the private hospital sector in Jeddah Governorate. Alandlus Journal of Social and Applied Sciences. Volume 3, Issue 5.210, p. 201

devices and their applications and the extent to consider them material things that require special care, and dedicate the objective responsibility of damage resulted from the use of artificial intelligence and their applications in the second requirement.

First requirement

Legal adaptation to the nature of artificial intelligence devices and their applications and the extent to consider them material things that require special care

The use of artificial intelligence devices became widespread in all industrial and medical aspects of life and resulted in direct contact with humans and their property, and as a result of this use errors occur which resulted in serious damage that requires fair compensation to the harmed person ²⁹.

Jordanian Civil Law explained the legal base of responsibility for doing things, as it began with keeping animal in the Article (289) of it, responsibility of a building owner in the Article (290) of it, then responsibility of the keeper of mechanical equipment and dangerous objects in the Article (291) of it ³⁰.

In order to reach the legal base of the nature of these artificial intelligence devices and if they could be considered among material objects that require special care where their keeper take responsibility and he will be responsible for compensation for the damage resulted from them. So, we will review the jurisprudential theories dealt with the nature of objects and Mechanical machines, and adopted the objective responsibility and the extent of their application on artificial intelligence devices, then applying public rules in law on them, so we will deal with this

²⁹ Dr. Salam Karim, previous reference, p 143.

³⁰See the text of Article (289) of the Jordanian Civil Code and the text of Article (290) .

theory, and we will deal with the theory of keeping, then the theory of bearing dependency on risks second.

First: Theory of Keeping and the extent of applying it on artificial intelligence devices

Jordanian Civil Law addressed responsibility of keeping objects in the text of the Article (291) of it, by saying: “Anyone who has at his disposal things that require special care to prevent their damage or mechanical devices shall be liable for the damage caused by these things, except for what cannot be kept against, without prejudice including the special provisions contained therein” .

By inducting the text of Article (291), we find that Jordanian Civil Law requires a set of conditions that will be dealt in order that the responsibility of keeping objects will be held and compensation should be required, and their extent to be applied on artificial intelligence devices and its applications; the most important of these conditions are keeping, damage occurs caused by the object which should be serious that requires a special care, so we will explain the condition of keeping according to this theory and the extent of its application on artificial intelligence devices, where keeping means that a keeper must have actual authority on an object or a machine which caused damage, and he has the right to intervene positively with it regardless the legal source of this control, and this actual authority is available with existence of two elements: the material element which is the power of the use of an object and he has the right of direction, the second element is the moral one, as he must exercise these powers by himself and for his own account ³¹.

³¹ Dr.. Badr Jassim Al-Yaqoub, Responsibility for dangerous objects, PhD thesis, Cairo University Law, Egypt, Cairo, 1977, pp. 47-48.

Throughout applying this condition stated by the Article (291) in Jordanian Civil Law, we find artificial intelligence devices are electronically programmed devices and operate independently, and material machines made from objects which they were accurately programmed and directed by their owner who considers their keeper or whoever is acting under his command whether in the industrial or medical sector. The owner must have actual power and the devices work by his direction or whoever is acting under his command. By this, the actual power and control on the devices are achieved through its material and moral elements, as he controls them by himself, work for his account and obtains economic income from them. Artificial intelligence devices and their applications are considered from precision machines which need special care whether in their use or keeping, and they may cause damage to a person or his properties, therefore we find that this condition of the responsibility of damage of objects is achieved and available, and from objectives that require special care in their keeping and use, and damage resulted from them achieves one of the civil responsibility pillars ³².

According to the public rules in Jordanian Civil Law, the keeper of intelligent system and artificial intelligent devices, despites the fact that industrial robots devices have a type of independency and ability to avoid errors , their owners (keepers) take responsibility of errors resulted from their operation by default for his account without a need to prove the keeper's error , and responsibility can only be defended by proving the external reason ³³.

³² Dr. Issa Hamadin, *Negligent civil responsibility for environmental damage, a comparative study between Jordanian civil law and Egyptian law*, Hamada House for University Studies, Publishing and Distribution, Irbid, Jordan 2008, p. 122.

³³ Salam Karim, previous reference, p 147.

But a part of jurisprudence criticized this by saying that even artificial intelligent devices are subject to keeping rules by default, it is difficult to determine the concept of keeping depending on their saying on the Article (1348) which is amended by the Article (1242) of the French Civil Law which assumes that the keeper is the owner, and this cannot be applied to artificial intelligent devices as it is a part of intellectual property, where the property of software is attributed to its author or owner. Intellectual property is not linked to the idea of control, and if it is linked to, it will be to protect it legally³⁴.

Another part of jurisprudence thinks throughout replying to this criticism that artificial intelligent devices have two dimensions: the material dimension and the moral one; the moral dimension is linked to the concept of artificial intelligent, while the material one it is represented in the physical carrier of the smart system and needs an intervention of a large number of actors such as the digital programmer, the material designer, industrial companies with their various levels and roles, intermediaries, user and even owner. Throughout the concept of artificial intelligence, it is necessary to determine the concept of a keeper, as it is a must to detect the source of damage if it is considered a machine³⁵.

As for what is stated in Article (291) by its saying (...what cannot be prevented), the harmed person is not obligated to prove the error of the user of artificial intelligence devices, but proving what cannot be prevented is the responsibility of the defendant, who is the owner or user of artificial intelligence devices either by severing the causal relationship or by proving the external cause³⁶.

³⁴ Dr. Salam Karim, previous reference, p142.

³⁵ Dr. Salam Karim, previous reference, p143.

³⁶Dr.. Ahmed Ibrahim Al-Hiyari, study entitled () published in the Kuwaiti International Law Journal, Issue 4, Fifth Year, Serial Issue 20, Rabi' Al-Awwal / Rabi' Al-Thani, December, 2017, p. 127. It will be referred to as Dr. Ahmed Ibrahim Al-Hiyari, previous reference, p. 131.

The researcher thinks that artificial intelligence devices as long as artificial intelligence devices exist under the control of the owner, he is considered their keeper. Likewise, whoever uses them among those working under the command of the owner (the keeper) is considered to have real control over them, he also owns control and direction and generates economic returns to him through its use, and therefor he is responsible for damages resulted from its use and he must compensate the user on the base of the assumed error.

Second: Risk Bearing Theory

This theory stated on that whoever caused a risk, did a work which achieved an advantage to him or practiced an activity that has an actual and legal power on others, he is responsible for any resulted damage from this risk, as this theory is called dependency theory.

According to this theory, the causer of damage cannot evade responsibility, since the activity he did generate a material and economic and financial gain, and therefor he must bear risk dependency achieved from his activity and resulted in damage (gain for loss).

By applying this theory to artificial intelligence devices and their use, we find this theory and what it requires are available, i.e. when damage occurs, the user of artificial intelligence devices or their owner (keeper) is obligated to compensate for damage caused by these devices.

The objective responsibility of the user of artificial intelligence devices can be justified through several considerations, the most important of which are:

1. Justice, since whoever causes a risk must bear its responsibility.

2. Bearing of objective responsibility make the user of artificial intelligence devices use them skillfully and take the necessary precautions to prevent damage.

3. There are economic considerations indicating that anyone who engages in an activity that generates material profit and economic returns must bear compensation in case harm occurs³⁷.

An aspect of jurisprudence thinks that if damage occurs due to a machine, then the action of the machine in this case is considered to be as a causer in relation to its keeper³⁸.

The researcher thinks that this theory can be applied to damage resulted from artificial intelligence devices to preserve the harmed person's rights in having fair compensation, because the owner of these devices with what he owns of power of use and direction by his action causes a risk resulting in harm, so in order to achieve justice, he has to bear the result of this and compensate for damage.

Second requirement

Devoting objective responsibility for damages resulting from the use of artificial intelligence devices and its applications

Taking into consideration that artificial intelligence devices are material objects and require special care by their users and owners, and because of widespread and rapid development in their use in all industrial and medical aspects of life as they are used in surgical operations, it necessary to establish a direct relation to deal with human, and as a result of this, damage to the human body or his properties, and therefore , these devices are run by their owner and they generate financial

³⁷ Dr. Ahmad Ibrahim Al-Hiyari, previous reference, p132.

³⁸ Dr. Ahmed Abdul Karim Abu Shanab, The Legal Basis for Responsibility for Doing Something in Jordanian Civil Law and Islamic Jurisprudence, A Comparative Legal Study, Mutah Research and Studies, Volume 15, Issue 4, Mutah, Jordan, 2000, pp. 37-62

profit to him. As for the harmed person, he is the weakest link that should be preserved, and in order that the essential protection is achieved to him, the objective responsibility should be devoted and error should be excluded and proven by the harmed person.

In order for the elements of this responsibility to be established for the user of artificial intelligence devices for the damages resulting from their use, we will address the supposed error as a basis for objective responsibility, then the damage second, and then we will finally address the causal relationship.

First: The supposed error as a base for the objective responsibility of damage resulting from artificial intelligence devices.

In a traditional concept, an error is considered a basic pillar in the civil responsibility (tort responsibility), as this the situation of several legislations that derived their texts from the French Law, but modern legal legislations and applications revealed tendency to move away from this concept and adopted an new one which is the objective responsibility.

Therefore, Jordanian legislator in Jordanian Civil Law derived from Islamic jurisprudence adopted the concept of objective responsibility, as he established the civil responsibility on the pillar of damage (harmed action), where the Article (256) of Jordanian Civil Law stated on “Every damage to others obligates its perpetrator, even if he is not discerning, to guarantee the damage”. Through inducting this text, we find that Jordanian legislator is influenced by Islamic jurisprudence, and it did not stipulate proof of error against the one who caused the harm. Thus, the term damage that the Jordanian legislator has adopted is meant illegal action or that violates the law, and it is applied to action or non-action

which leads to damage, and causing harm to others should be in a way that is not accepted³⁹.

It is not permissible for a person to harm another person or his property by doing something that is not permissible. In the event that it is permissible, the rule applies, which states: “The legal permissibility contradicts the guarantee.”⁴⁰ In this case whoever practices his legal right without abuse is not obliged to compensate for damage, and he is not also obliged to prove availability of all common civil responsibility pillars traditionally ⁴¹ through leaving error as a base of the civil responsibility for damage resulted from the use of artificial intelligence devices as Jordanian legislator did as he establishes the civil responsibility on damage that replaces error as a material pillar.

Among the justifications of adopting objective responsibility and considering errors assumed or damage, it forms the base support to ensure that the harmed person obtains his right by compensation for damage resulted from the use of artificial intelligence devices ⁴² , whether this error was issued by the user of a device or not, and the user cannot evade responsibility by proving that what he has done was a must in order that no damage occur. In addition, Among the justifications of adopting objective responsibility in countries establishing responsibility on error as a basic pillar for the dangerous nature of the use of artificial intelligence devices and inadequacy of error theory to provide the essential protection to harmed people from artificial intelligence devices, and adopting objective responsibility obliges user of these devices to insure from civil

³⁹ Dr.. Sarhan Adnan, *Involuntary Sources of Commitment*, University of Sharjah Library, UAE, Sharjah, 1st edition, pp. 18-19.

⁴⁰ See the text of the Article (61) of Jordanian Civil Law which similar to the same Article (91) of Journal of Justice Provisions.

⁴¹ Catherine Roche, *Responsabilite' civile du fait, accidents nucle'aires le petil* jurist ,3juin215,p.8.

⁴² Dr. Ahmed Ibrahim Al-Hiyari, previous reference, p 127.

responsibility for damage resulting from their use in order that the harmed person obtains his right in fair compensation ⁴³, as Jordanian law devotes objective responsibility but it does not oblige insurance for this responsibility.

Second: damage

Damage means harm occurred to a person that befalls a person as a result of violating one of his rights or a legitimate interest, whether that right or interest is related to the safety of his body, his emotions, his money, his freedom, his honor and prestige, or something else ⁴⁴. Damage could be material or moral; material damage is what befalls a person in his body and money, and moral damage is what befalls him in his feelings, affection, dignity, or honor⁴⁵. A part of jurisprudence divides damage into three types: financial, moral and body damage⁴⁶. There is an agreement among legal jurisprudence about the base of civil responsibility on the condition of error occurrence in order to question the causer of damage for his illegal action, so it is considered the basic element in it ⁴⁷.

The damage may influence the person directly affected, or its effects may extend to others who are related to the affected person by any relationship. For the damage for which the responsible person must be asked to compensate, certain conditions must be met, which are that the damage must have actually occurred or that it will inevitably occur in the future, and that the damage must be achieved. Therefore, the damage is divided into current damage and future damage, unlike potential damage that cannot be done. It must be a basis for compensation, as the achieved

⁴³Dr. Ahmed Ibrahim Al-Hiyari, previous reference, p 127.

⁴⁴ Al-Danasouri, Ezz El-Din, and Al-Shawarbi, Abdel Hamid, 1988, Civil responsibility in the Light of Jurisprudence and Judiciary, p. 1262.

⁴⁵Sultan, Anwar, 2019, Sources of commitment in civil law, Is. 11, Dar Al Thaqafa for Publishing and Distribution, p330.

⁴⁶ Dr. Sarhan Adnan, Involuntary Sources of Commitment, University of Sharjah Library, UAE, Sharjah, 1st edition, p. 18.

⁴⁷ Al Danoun, Hassan Ali, 1970, foundations of commitment, Al-Ma'arif Press, Iraq, Baghdad, p222.

damage and the actual damage is the confirmed damage that actually occurred, affecting the victim's soul, body, money, or honor, and the damage must be certain⁴⁸. In the event that a person is injured as a result of the medical robot being out of control, then compensation is required⁴⁹. Future damage is damage that has not yet occurred but will certainly occur in the future. It is damage that has been achieved but its effects have subsided into the future. An example of future damage that is certain to occur is when a person is injured in an accident and the injury is certain, but its future results are not known exactly, in this case, the judge may rule compensation for the damage that has been achieved. In fact, the injured person should be given a period of time after which he will come back to assess the damage in its final image. As for potential damage, it is damage that is not certain to occur. It may occur or it may not. This cannot be compensated but only if it actually occurs.

The researcher finds that it is possible to imagine occurrence of damage in its two material and moral images from artificial intelligence applications, but it is necessary to distinguish whether damage is occurred through a contract or not⁵⁰.

In case that damage resulted from artificial intelligence applications is a contracted one, compensation is required only for the expected damage, i.e. what is within the limits of the two parts expectation, provided that the debtor's breach of his contractual obligations does not result from fraud or serious error, here the door to responsibility is wide open, and he is compensated for the damage, whether expected or unexpected. While in the context of tort responsibility, the aspect of

⁴⁸Al-Fadl, Munther, Al-Waseet in Explanation of the Civil Law, Sources of obligations and their provisions, 1st edition, Dar Al-Thaqafa for Publishing and Distribution, Amman, 2012, p. 280.

⁴⁹ Dr Hakam Hassan Al-Ajarmah's, Civil responsibility for artificial intelligence damages in Jordanian legislation, An analytical study in Jordanian Civil Law, research published in the Journal of the Jordanian University of Zaytoonah for Legal Studies, Volume 4, Issue 2, Amman, Jordan, 2023, pp. 151-154. It will be referred to as Hassan Al-Ajarmah. , Previous reference

⁵⁰ Ajarmeh, Hassan, previous reference, p151-154.

compensation is considered broader, as compensation is made for expected and unexpected direct damage ⁵¹.

Compensation should be for direct, expected damage only unless the debtor commits fraud or a serious error, in which case the door to tort responsibility opens wide and the creditor is compensated for direct, whether it is expected or unexpected damage which enter within moral damage. Referring to Judiciary of the Distinguished Jordanian Court of Cassation, we find some provisions allow compensation for moral damage in case that the debtor committed fraud or a serious error, it stated in its ruling, “One of the established jurisprudences in contractual responsibility is limited to the damage that actually occurred when it occurred.” The provisions of jurisprudence ruled that no compensation for moral damage in the contracted responsibility unless the contracted error included fraud or serious error ⁵².

In another ruling it judged “Compensation for lost profits and moral compensation in contractual liability shall not be awarded except in cases of fraud and serious error” ⁵³.

The researcher thinks that the imagination of compensation for moral damage within the contracted responsibility, even if it is rare for it to occur in contractual responsibility, this does not prevent the permissibility of compensation for it, as rare is not the same as nonexistent. It is possible to compensate for moral damage resulting from a breach of a contractual obligation if the debtor commits fraud or a serious error, so in this case, the door is wide open for compensation. The

⁵¹ Tanago, Sameer Abdel Sayed, Sources of commitment, is.1, Al-Wafa Legal Bookshop, Alexandria, 2009, p247.

⁵² Jordanian Court of Cassation in its legal capacity No. 7159 of 2018 issued on 11/21/2018, your decision website.

⁵³The Jordanian Court of Cassation in its legal capacity No. 1391 of 2 The Jordanian Court of Cassation in its legal capacity No. 7159 of 2018 Issued on 11/21/2018 Your decision website

contractual relationship is treated as an obligation arising from damage act in terms of the scope of compensation for it ⁵⁴.

Causal relationship

It I the third pillar of civil responsibility, and it is the relation between a contracted error or harmful act and occurred damage, so in case a robot of a vacuum cleaner caused damage to the user, the harmed person proved the occurred damage due to the established fault by the robot ⁵⁵, the causal relationship can be also cut in case the causer of damage proved that the occurred act or error resulted from external reason or the damage act itself or others' act.

Conclusion

After the researcher has explained the concept of artificial intelligence and its characteristics and the legal adaption of artificial intelligence devices as they considered material objects that need special care, and devoting the objective responsibility of damage resulted from artificial intelligence devices, the researcher ended his study by showing the pillars of civil responsibility of artificial intelligence and devoting the objective responsibility as error is assumed, then damage and causal relationship, the study reached a set of results and recommendations, the most important of which are:

Results

1. Artificial intelligence devices can be defined as they are serious material things that need special care with special nature that perform acts and tasks similar to human intelligence and abilities.

⁵⁴Ajarmeh, Hassan, Mechanism of transferring compensation for moral damage to heir, Journal of Legal and Political Sciences, Volume 34, issue 1, Pork Academy, Denmark, 2023, p295

⁵⁵ Badr, Majdoline, 2022, Civil Liability Arising from the Use of Artificial Intelligence Technologies in Jordanian Legislation, Master's Thesis, Middle East University, Faculty of Law, Department of Private Law. , p. 55

2. Legal jurisprudence disagreed about granting artificial intelligence a legal personality, and the most correct opinion is granting super smart applications a restricted legal personality gives them a set of benefits and rights.
3. Although artificial intelligence devices spread widely, Jordanian legislator did not realize their importance until now in order to issue a legislation that explains responsibility provisions of damage resulted from them whether to human, properties or environment, as they are still subject to public provisions.
4. Jordanian government direction to issue National Code of Ethics for Artificial Intelligence is considered a first step in legal organization aspect of artificial intelligence in Jordan.
5. The provisions of contracted responsibility according to Jordanian Civil Law are inefficient to protect harmed people from artificial intelligent contracts; so it necessary to raise the degree of contracted responsibility and it's assumed to achieve a result not taking care.
6. Legal commitment in tort responsibility is taking care of a habitual person, and in order to face artificial intelligent devices and reduce them, there should be a commitment to achieve a result.

Recommendations

1. Expediting the issuance of special legislation in Jordanian legislation that deals with regulating provisions related to artificial intelligence. Granting artificial intelligence applications a restricted legal personality.
2. Raising the degree of contracted responsibility through taking care, as commitment should achieve a result to reduce the amount of damage resulted from these applications.

3. Amending rules of tort responsibility relating to compensation for damage resulted from artificial intelligence applications to adopting standard of the careful person instead of habitual person, and his commitment is to achieve a result instead of take care.
4. The legislation should provide for the establishment of a special guarantee fund to compensate for damages arising from artificial intelligence applications.
5. The legislation must oblige everyone who deals with artificial intelligence devices and applications to obligatory insurance when he buys or rent any artificial intelligence applications like the obligatory insurance imposed on vehicles.

References

- Abu Mandour, Mustafa Musa. (2022). *The adequacy of the general rules of civil liability in compensating for artificial intelligence damages. A comparative analytical study. Damietta Law Journal for Legal and Economic Studies*, fifth issue, Damietta, Egypt.
- Abu Shanab, Ahmed. (2000). The Legal Basis for Responsibility for Doing Something in Jordanian Civil Law and Islamic Jurisprudence, A Comparative Legal Study. *Mutah Research and Studies*, 15(4), Mutah, Jordan.
- Adrien Bonnet, La Responsabilite.(2011-2015) *du Fait de Lintelligence artificielle Me'moire de recherche droit prive' ge'ne'ral,unversite' panthe'on, parisii*, 2011-2015
- Ajarmeh, Hassan. (2023).Mechanism of transferring compensation for moral damage to heir. *Journal of Legal and Political Sciences*, 34 (1), Pork Academy, Denmark.
- Al Danoun, Hassan , (1970). *Foundations of commitment*, Al-Ma'arif Press,

Baghdad, Iraq.

Al Mubarak, Suleiman. (2010). *Introduction to the organization of experience and the steps of its design. Scientific symposium on expert systems for fighting fires in construction*. Naif Arab University for Science and Security, Riyadh, Saudi Arabia.

Al-Ajarmah, Hassan.(2023). Civil responsibility for artificial intelligence damages in Jordanian legislation, An analytical study in Jordanian Civil Law. *Journal of the Jordanian University of Zaytoonah for Legal Studies*, 4(2), Amman, Jordan.

Al-Ajarmah, Hassan. (2023). Mechanism of transferring compensation for moral damage to heirs, *Journal of Legal and Political Sciences*, 34(1), Pork Academy..

Al-Danasouri, Ezz El-Din and Al-Shawarbi, Abdel Hamid. (1988). *Civil responsibility in the Light of Jurisprudence and Judiciary*.

Al-Fadl, Munther. (2012). *Al-Waseet in Explanation of the Civil Law, Sources of obligations and their provisions*. 1st edition, Dar Al-Thaqafa for Publishing and Distribution, Amman.

Al-Hiyari, Ahmed. (2017) . *Kuwaiti International Law Journal*, 20(4), Fifth Year.

Al-Yaqoub, Badr.(1977). *Responsibility for dangerous objects*, PhD thesis, Cairo University Law, Egypt.

An article entitled "Artificial intelligence in EU: Balance between advantage" at

<https://ar.eureporter.co/frontpage/2021/01/01/ai-in-the-eu-balancing>

Arnous, Bashir.(2007). *Artificial intelligence*. Dar Al-Sahab for Publishing and Distribution. Cairo, Egypt.

Badr, Majdoline. (2022). *Civil responsibility Arising from the Use of Artificial Intelligence Technologies in Jordanian Legislation*, Master's Thesis, Middle East University, Faculty of Law, Department of Private Law.

Catherine Roche . *Responsabilite' civile du fait des ,accidents nucle'aires le petil*

jurist ,3juin215.

Christian Yusuf.(2020). *civil responsibility for artificial intelligence action*, MA thesis, introduced to the Council of Law and Political Sciences, Lebanese University.

Dahshan, Yahia Ibrahim.(2019). Criminal responsibility of artificial intelligence, *Journal of Sharia and Law*, Faculty of Law, UAS University.

Ghaleb, Yassin. (2011). *Basics of Administrative Information Systems and Information Technology*. 1st edition, Dar Al-Manahij for Publishing and Distribution, Amman, Jordan.

Hamadin, Issa.(2008). *Negligent civil responsibility for environmental damage, a comparative study between Jordanian civil law and Egyptian law*. Hamada House for University Studies, Publishing and Distribution, Irbid, Jordan.

Article entitled : Artificial intelligence in EU: Balance between profit at:

<https://ar.eureporter.co/frontpage/2021/01/01/ai-in-the-eu-balancing/> - Caferra Ricardo: Logique pour l'informatique et pour l'intelligence artificielle Hermes Sciences Publication, Paris, France, 2011

Imam, Sahar.(). Reflections of digital era on values and traditions of jurisprudence. *Egyptian Journal for Legal and Economic Studies*, (10),

Karim, Salam Abdulla. (2022). *Legal Regulation of Artificial Intelligence, a comparative study*. PhD thesis submitted to the Council of the College of Law, University of Karbala, Iraq.

Mahdi, Saleh.(). Using expert systems as an introduction for developing the performance of the external auditor. Doctoral thesis in business administration. Amman Arab University, Amman, Jordan.

Nassif Omar Abdel Hilal.(2010). Using artificial intelligence systems as a tool for excellence in quality and competitiveness. A field study in the private

hospital sector in Jeddah Governorate. *Alandlus Journal of Social and Applied Sciences*, 3, (5).

Nour elkaakour. L'intelligence. (2017). *Artificielle et la responsabilité civile de l'ictuelle, Mémoire pour l'obtention du Diplôme d'Etudes Approfondies En Droit Interne et International des Affaires* université LIBANISE Faculté de droit et des sciences politiques et Administratives file francophone. P03ET24.

Oxford Dictionaries, "Artificial Intelligence" (en. oxford dictionaries .com/definition /artificial_intelligenc) , 27 / 1/ 2021.

Proposal for a ((REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL LAYING DOWN HARMONISED RULES ON Artificial Intelligence (ARTIFICIAL INTELLIGENCE ACT) AND AMENDING CERTAIN UNION, Brussels, 2021, p8.

Rapport de synthèses sur les aspects généraux de la bioéthique .(2018) . Comité consultative national d'éthique, glossaire, p.110 : ((Construction de programmes informatiques qui s'adonnent à des tâches qui sont, pour l'instant, accomplies de façon plus satisfaisante par des êtres humains car elles demandent des processus mentaux de haut niveau tels que : l'apprentissage perceptuel l'organisation de la mémoire et le raisonnement critique)) .

Sarhan Adnan.(). *Involuntary Sources of Commitment*. 1st edition, University of Sharjah Library, UAE, Sharjah.

Sultan, Anwar.(2019). *Sources of commitment in civil law*. Is. 11, Dar Al Thaqafa for Publishing and Distribution.

Tanago, Sameer Abdel Sayed.(2009). *Sources of commitment*. 1st issue, Al-Wafa Legal Bookshop, Alexandria.

Thagard P. (1998). *Computational philosophy of science*. The MIT Press, Edition, London, England .

Laws

Jordanian Civil Law No.43 of

Courts' decisions

1. Jordanian Court of Cassation in its legal capacity No. 7159 of 2018 issued on 11/21/2018, your decision website
2. Jordanian Court of Cassation in its legal capacity No. 1391 of

