International Journal of
Legal & Religious Sciences
Edition 47th
Vol. (6) Issue (3)
(1-39) 2023

The legal basis for liability resulting from damages from the use of artificial intelligence (Comparative Study)

Dr. FAISAL MOUSA ABEDALQADER ALHYARI
Assistant Professor of Civil Law Head of the Private Law Department, Israa University, Faculty of Law
Dr. YOUNIS OKLEH MUFLIH ALMAHASNEH
Published on: 31 Dec. 2023

Abstract

With the increasing adoption of artificial intelligence technologies, questions related to liability for damage caused by artificial intelligence systems have become more urgent. The lack of clear legal frameworks poses challenges in determining liability and providing remedies for those affected by damage associated with artificial intelligence. Therefore, the researchers aimed to study the legal foundations of liability arising from artificial intelligence damages. The study also aims to identify gaps and challenges in the current legal frameworks and propose recommendations to address liability in the context of artificial intelligence technologies. The results of the study highlighted countries as having the greatest damage resulting from the use of artificial intelligence which came as follows: China, then the United States, then Germany, then the United Kingdom, then South Korea. In the end, Canada comes. It is worth mentioning that the United States is emerging as a country that has taken important steps to reduce the damage associated with artificial intelligence. The United States and the United Kingdom have also been recognized as the best supporting societies when it comes to the legal basis of liability resulting from the use of artificial intelligence. These countries have shown proactive efforts in dealing with the ethics of artificial intelligence and spreading it responsibly, which reflects their commitment to mitigate potential damage and ensure accountability. This research also throws It highlights the legal underpinnings of liability in the context of AI harms and provides valuable insights on countries that have made progress in addressing AI-related harms and highlights the importance of proactive measures in ensuring the responsible use of AI technologies as the results of the study contribute to ongoing discussions and efforts to

create a strong legal framework for AI liability.

Keywords: Liability, Legal Basis, Artificial Intelligence, Accountability

* Introduction

The legal basis for liability resulting from the use of artificial intelligence (AI) is an evolving and complex area of law as AI technology continues to advance and become more integrated into various industries and applications {1} where questions of accountability, liability and potential harm arise. Creating a clear legal framework to address AI liability is critical to ensure fairness, protection and appropriate recourse for individuals and communities affected by AI systems. One of the key legal principles that can be applied to AI liability is negligence. Negligence includes a lack of reasonable care leading to harm to others. In the context of AI, negligence may be attributed to developers or users who have failed to take the necessary precautions or implement the appropriate safeguards in the design, development or operation of AI systems. For example, if an autonomous vehicle equipped with AI causes an accident due to a design defect or inadequate testing, responsible parties may be held responsible for its negligence.{18}

Product liability laws also play an important role in liability related to artificial intelligence. If artificial intelligence systems are considered products, manufacturers, distributors or vendors may be held accountable for defects or malfunctions that cause damage. For example, if an artificial intelligence medical device provides incorrect diagnoses that lead to harm to the patient, the manufacturer may face product liability claims. {2} Strict liability principles can be activated in cases related to artificial intelligence. Strict liability may be held by the parties responsible for damage caused by their actions or products, regardless of the level of their fault or negligence. If an artificial intelligence system causes damage even without negligence or intent, strict liability may be invoked. This approach ensures the ability of the affected parties to seek compensation without the need to prove negligence. {19} Contractual liability is another aspect of AI liability. Parties involved in the development, deployment or use of artificial intelligence may allocate liability through contracts. These contracts may specify liabilities, guarantees, compensation terms and other provisions to determine liability in the event of AI-related damage.{20}

Intellectual property and copyright laws can also apply to AI liability. If an AI system violates existing patents, copyrights, or trademarks, resulting in damage, the responsible party may be held responsible for intellectual property violations. {21} Data protection and privacy concerns prevail in AI. Due

to the huge amounts of data processed, organizations that fail to comply with applicable data protection regulations and expose personal information to harm may face liability for data or privacy violations. Regulatory compliance is important in AI liability. Specific regulations and standards may govern the use of AI in various industries and jurisdictions. Failure to comply with such regulations, such as those related to safety or security, may result in holding responsible parties accountable. {22}

However, it is noted that AI liability laws are still under development and different jurisdictions may have different approaches as courts, policymakers and legal experts are actively working to establish clear guidelines to address AI liability. {3}The aim is to strike a balance between promoting innovation and ensuring accountability and protection for individuals and companies affected by AI-related harms. As AI technology continues to advance and integrate further into society, it is essential that legal systems adapt and address the unique challenges posed by AI. By creating a strong legal basis for AI liability, responsible development and deployment of AI systems can be promoted while protecting the rights and interests of those affected by their use. {4}

*** Study problem**

The study deepens on the legal basis of liability for damages resulting from the use of artificial intelligence. At the complex intersection between technology and legal foundations, this study seeks to address the crucial question of accountability and responsibility when artificial intelligence systems cause damage. By studying the legal basis of civil and social liability, exploring its impact on societies and individuals, analyzing the use of artificial intelligence and highlighting the damages associated with its use, the problem resulting from the legal imbalance in liability can be highlighted. {5}

The legal basis for the liability resulting from the use of artificial intelligence lies within the existing legal frameworks governing civil and social liability. These frameworks include various legal principles such as negligence, product liability, strict liability, contractual liability, intellectual property and data protection. Negligence holds individuals or societies responsible for failing to exercise care, while product liability places liability on manufacturers for defects or malfunctions, while strict liability extends liability regardless of fault, while contractual liability allocates liability through agreements. Intellectual property and data protection laws also contribute to the legal basis of liability. {6}

The legal basis for liability for AI-related damages has a profound impact on communities and individuals. It establishes an

accountability framework that ensures that those affected by AI systems have legal recourse and can claim compensation for damages. {23} By holding developers, operators and users accountable, the legal basis enhances trust, encourages responsible development, and stimulates adherence to safety, ethics and privacy standards. It also enhances transparency and protection for individuals and companies, ensuring the right balance between the benefits and risks of AI. {6}

Artificial intelligence refers to the development of intelligent systems that can perform tasks independently and simulate intelligence. Artificial intelligence is widely used in various fields, including health care, finance and transportation. Its applications range from self-driving cars and medical diagnostic systems to fraud detection algorithms and virtual assistants. The use of artificial intelligence brings enormous benefits such as increased efficiency, productivity and innovation. However, it also presents unique challenges, including the potential damage that can arise from its use. {7}

These harms can include a range of issues, including safety concerns, such as accidents caused by self-driving cars or malfunctions in artificial intelligence systems. Ethical dilemmas arise when artificial intelligence algorithms show bias or discrimination.

Privacy violations can also occur when personal data is mishandled or misused, and AI can lead to a lack of jobs and economic inequality, underscoring the need for clear responsibility frameworks to address the consequences of AI use and protect individuals and communities from potential negative impacts.[8]

Therefore, the problem resulting from the legal imbalance in liability arising from the damages of the use of artificial intelligence is an important area. Research on the legal basis for liability for damages associated with artificial intelligence provides insight into the complexities of accountability and responsibility in the rapidly advancing field of artificial intelligence. By understanding the legal foundations, analyzing the societal impact and recognizing the potential damages associated with artificial intelligence, we can work to establish a balanced and fair legal framework that promotes the responsible development of artificial intelligence and protects the rights and well-being of individuals and societies. Therefore, this study is guided by the following research questions:-

1- What legal frameworks exist that define the legal basis for liability in cases where damages result from the use of AI?

2- What are the current legal frameworks for liability for damages resulting from the use of AI in the UK?

3- What are the legal bases for AI damage liability in the US and how are they different from the UK?
4- How does Canada deal with the legal basis of liability in cases of damage caused by artificial intelligence and what are the main similarities and differences compared to the UK and the US?
5- What are the specific legal provisions and regulations in Russia regarding liability for damage caused by the use of AI and how can they be compared to other countries studied?
6- How does China address the legal basis of liability for damage caused by AI and what are the main legal principles and regulations governing AI-related liability in China compared to other countries?
7- What are the common challenges and emerging trends in the legal frameworks of these focus countries with regard to liability for damage caused by the use of AI?
8- How do international collaborations and efforts contribute to the development of legal bases for AI damage liability and what are the implications for the global harmonization of AI liability laws?

*** Importance of the Study**

*** Scientific Importance**

The study is of great scientific importance because it contributes to the legal field by deepening understanding of the legal basis of liability in cases where damages result from the use of artificial intelligence

2- By conducting a comparative analysis of different legal systems, the study can identify similarities, differences and best practices across jurisdictions. This helps to bridge the gap between different legal approaches and enables the development of a more comprehensive understanding of the legal basis of liability in the context of AI-related damages

The results of this comparative study can provide valuable insights to policy makers, legislators and legal experts and can enrich discussions on legal reforms and the development of new legislation or regulations that address the complex challenges posed by artificial intelligence. By identifying gaps or inconsistencies in existing legal frameworks, the study can contribute to efforts continuing to adapt the law to the rapidly evolving technological landscape

*** Practical importance**

1- The study has great applied importance because it provides guidance to policy makers and regulators, and by analyzing the legal basis for liability for damages associated with artificial intelligence, the study can help create policies and systems that achieve a balance between encouraging innovation and protecting the rights and interests of individuals and companies.
2- The results of the study are of great interest to individuals and entities involved in the development, deployment or use of AI and by clarifying the legal basis for liability

the study helps to protect stakeholders from potential risks and uncertainties associated with damage caused by AI.

3- Understanding the legal basis for liability for AI-related damages is critical to enhancing trust in AI technologies. The study contributes to the development of responsible AI practices, guidelines and ethical standards. It helps ensure that AI systems are developed and deployed in a way that prioritizes safety, transparency and privacy, thereby promoting the responsible and ethical use of AI.

*** Objectives of the study**

The objectives of the study include:-

1- Examine and compare existing legal frameworks across different jurisdictions that define the legal basis for liability in cases where damages result from the use of AI

2- Analyze and compare the application of negligence principles in different legal systems and understand how reasonable care is defined and applied in the context of AI-related harms

3- Compare and evaluate approaches to product liability laws in various jurisdictions and understand how manufacturers, distributors or vendors are held accountable for defects or malfunctions in AI systems that cause damage

4- Assess differences in the implementation of strict liability principles in different legal systems and understand their implications for liability in AI-related damages.

5- Explore and compare the implications of data protection and privacy regulations for liability in AI-related damages and understand the legal consequences of non-compliance.

6- Evaluate the approaches of different legal systems in addressing the unique challenges and potential harms associated with the use of AI such as safety concerns, ethical dilemmas, privacy violations, and economic inequalities.

7- Assess the impact of the legal basis of liability for AI-related damages on communities and individuals, including its role in enhancing trust, transparency, justice and protection.

8- Identify and highlight any legal imbalances or gaps in the framework of liability for AI-related damages across different jurisdictions and propose recommendations to achieve a more balanced and comprehensive legal framework

*** Methodology**

The study used a comparative research design to analyze and compare legal frameworks across multiple countries. This approach allows to identify similarities, differences and best practices regarding the legal basis of liability in cases where damages result from the use of artificial intelligence. The countries under study were selected purposefully to ensure representation from different regions and legal systems, taking into account factors

such as the level of development of artificial intelligence and legal frameworks and its relevance to the objectives of the study.

*** Legal Basis of Liability**

The legal basis of liability is the cornerstone of accountability and responsibility in legal systems as it provides the basis through which individuals, organizations or institutions can be held responsible for their actions or omissions that lead to harm to others. Understanding the legal basis of liability is crucial in supporting justice, protecting the rights of individuals and promoting a fair and orderly society. One of the basic legal principles on which liability is based is negligence. Negligence creates liability when a person fails to exercise reasonable care, which leads to harm or damage in order to prove negligence, it must be proven that the defendant owes a duty of care and that he violated this duty and caused expected damage through his actions or inaction. [24] Negligence applies to a wide range of cases, from car accidents to medical errors. The other important legal basis for liability is strict liability. Unlike negligence, it does not require proof of fault or negligence on the part of the defendant. Instead, strict liability holds individuals, communities or organizations responsible for harm or damage resulting from their actions regardless of intent or error, strict liability does not apply in cases involving inherently hazardous activities or products where the focus is on the dangerous nature of the activity or product rather than the fault of the defendant. [1]

Product liability is another important legal basis for liability. It holds manufacturers or distributors liable for damages caused by defective products. Product liability laws recognize that those who benefit from the sale of a product must be responsible for any damage resulting from defects in this product. This legal basis guarantees the protection of consumers and their right to resort to the law if they are harmed by a defective or dangerous product. Contractual liability also arises from the breach of an agreement or legally binding contract when one of the parties fails to fulfill its obligations as set out in the contract. It can be held responsible for any damages caused to the other party. Contractual liability provides a legal basis for the implementation of agreements and holding the parties accountable for their contractual obligations. [25]

Intellectual property laws establish liability for infringement of patents, copyrights, trademarks, or trade secrets where unauthorized use, reproduction, or distribution of protected intellectual property can result in legal liability and potential damages. Intellectual property rights are necessary to promote innovation, creativity, and economic growth. The legal basis of liability ensures that these rights are protected. [9]

Therefore, the legal basis of liability includes a set of principles and concepts that establish accountability and responsibility in legal systems, ranging from negligence and strict liability to contractual obligations and intellectual property rights. These legal bases ensure that individuals, organizations and entities can be held responsible for their actions or omissions that cause harm or damage. By understanding and applying the legal basis of liability, legal systems promote justice, protect the rights of individuals and provide remedies for those who have suffered harm.

*** The concept of legal bases of liability**

The legal bases of liability refer to the principles and rules that define the basis for holding individuals or societies accountable for their actions or negligence that led to harm. These bases are usually rooted in various legal doctrines such as negligence, product liability, and contractual obligations, as they provide a framework for determining liability, causation, and the extent of damages in claims. Legal Therefore, the legal foundations of liability aim to ensure fairness, justice and compensation for those who have been harmed by actions or products associated with artificial intelligence. [26]

*** Importance of the Legal Basis of Liability**

The importance of the legal foundations of liability cannot be exaggerated because they constitute the cornerstone of accountability within legal systems. These legal foundations provide a framework for determining when and under what circumstances individuals, organizations or societies can be held legally responsible for their actions or omissions that lead to harm to others. One of the main importance of the legal foundations of liability lies in their role in promoting responsibility and accountability. [1] By establishing clear standards and principles for determining responsibility, legal systems ensure that those who cause harm or damage are held accountable for their actions. This encourages individuals and organizations to act with care due diligence knowing that they will face legal consequences if they fail to meet their obligations or act negligently as the legal bases of liability play a crucial role in providing remedies and compensation to those who have suffered harm or damage. Through the accountability of responsible parties, individuals who have suffered injustice can seek justice and receive compensation for the losses they have suffered. This not only provides redress to victims but also acts as a deterrent to others who may be considering engaging in similar wrongful conduct. The legal bases of liability also serve as a guide for individuals and organizations to assist them To understand their legal obligations and the potential

consequences of not fulfilling these obligations and by providing clarity and predictability these legal rules enable individuals and organizations to make the right decisions and take the necessary precautions to prevent harm and this promotes a culture of compliance and responsible behavior which enhances the overall well-being and safety of the community. [26]

*** Objectives of the Legal Foundations of Responsibility to Society**

The objectives of the legal foundations of social responsibility revolve around promoting ethical behavior, ensuring accountability and enhancing positive impact on society. One of the main objectives is to establish clear standards of ethical behavior and promote responsible behavior. The legal foundations of social responsibility aim to identify and enforce legal obligations that go beyond just adhering to laws and regulations. It encourages individuals and organizations to adopt ethical practices that take into account the interests of stakeholders, including employees, customers and communities. By setting these standards, the legal foundations of social responsibility help to form a business culture and society that values integrity, justice and respect for all. [27]

Another goal is to ensure accountability and transparency. The legal foundations of social responsibility aim to hold individuals, organizations and communities accountable for their actions and ensure their transparency in their operations. By establishing legal requirements for reporting, disclosure and compliance, these foundations enable stakeholders to assess the social impact of companies and institutions. This accountability and transparency enhance trust, allowing stakeholders to make correct decisions and hold responsible parties accountable. The legal foundations of social responsibility also seek to encourage sustainable practices and environmental stewardship. With increasing recognition of the importance of preserving the environment, these objectives aim to integrate sustainability into legal frameworks, including promoting environmentally friendly practices, reducing carbon impacts, preserving natural resources, and mitigating the negative impact of activities on the environment. [28]

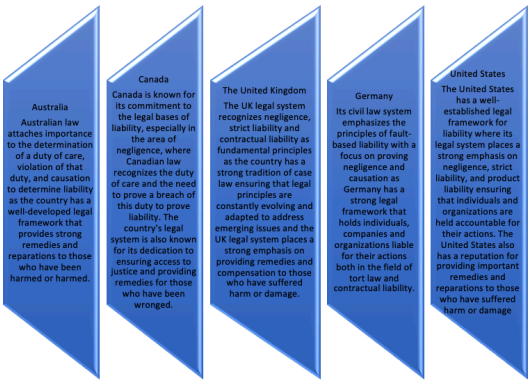
The objectives of the legal foundations of social responsibility include promoting social justice and inclusiveness, addressing social inequality, and protecting the rights of vulnerable groups as they seek to prevent discrimination, promote diversity and inclusion, and ensure equal opportunities for all members of society. [27]

Therefore, the goals of the legal bases of social responsibility revolve around promoting ethical behavior, ensuring accountability and

transparency, promoting sustainability, advocating for social justice, and encouraging community participation. By creating legal frameworks that support these goals, societies can create an enabling environment for individuals, organizations, and communities to work responsibly, make a positive impact, and contribute to improving society as a whole.

*** The best countries in applying the legal foundations of liability**

Identifying the best countries to apply the legal bases of responsibility can be subjective and depends on various factors. There are many countries that are recognized for their strong legal systems and their commitment to the principles of responsibility. These countries give priority to accountability, justice and the protection of individual rights. Although this list is not comprehensive, it provides an overview of countries known for their effective application of the legal bases of responsibility, including [29] [30]:-



(Figure 1)

*** Impact of legal bases of liability on societies**

The impact of the legal foundations of responsibility on societies is deep and far-reaching. These foundations play a crucial role in promoting accountability, protecting individual rights, ensuring justice and promoting a culture of responsibility within societies. One of the important effects is the promotion of ethical and responsible behavior. The legal foundations of responsibility set clear standards and expectations for individuals, organizations and societies to act in a manner that takes into account the interests and well-being of others. By holding individuals accountable for their actions or omissions, these foundations establish a strong deterrent against unethical behavior and encourage individuals and organizations to act with integrity and respect the rights of others. The legal foundations of responsibility contribute to the establishment of a just society and by holding individuals and organizations accountable for their wrongful acts. These foundations ensure justice and enable the aggrieved to seek compensation. This enhances confidence in the legal system as individuals trust in their ability to hold responsible parties accountable and obtain fair and equitable compensation for the harm they have suffered. [31]

The legal foundations of liability also provide a framework for protecting individual rights, whether through negligence, product liability,

or contractual obligations. These foundations ensure that individuals are not exposed to harm or damage due to the actions or negligence of others. The legal foundations of liability contribute to preventing harm and enhancing safety within societies and through establishing legal obligations and standards. These foundations encourage individuals and organizations to take the necessary precautions to prevent accidents or injuries. This not only protects individuals but also contributes to achieving general well-being and the stability of societies. [32]

*** Artificial Intelligence**

Artificial intelligence has revolutionized many aspects of life, changing the way we communicate and interact with technology. Artificial intelligence refers to the development of computer systems that can perform tasks that usually require human intelligence. This advanced technology has the ability to reshape industries, improve efficiency and drive innovation across multiple sectors. One of the important effects of artificial intelligence is its ability to automate tasks and processes that previously took a long time or a large effort of workers. It is possible for systems powered by artificial intelligence to analyze huge quantities from data, identifying patterns and making predictions or recommendations, enabling companies and institutions to make correct decisions. [33] In addition to automation, artificial intelligence enhances the capabilities of many industries, including health care, finance, transport and manufacturing. In the health field, artificial intelligence has the ability to revolutionize diagnosis and patient care. Algorithms powered by artificial intelligence can analyze medical images, identify distortions and help in the early detection of diseases. In the financial sector, artificial intelligence algorithms can analyze huge amounts of financial data, detect patterns and provide accurate predictions of decisions Investment AI-powered chatbots and virtual assistants have transformed customer service. Transportation has seen significant developments through AI, especially in the development of self-driving cars. AI-powered systems can process data in real time and make decisions. Although the potential of AI is enormous, it also raises important considerations regarding ethics, privacy and societal impact. As AI continues to evolve, ensuring transparency and accountability becomes important. Safeguards must be put in place to prevent bias, protect privacy and ensure that AI systems are used in a responsible and ethical manner. [34]

*** Artificial Intelligence definition**

Artificial intelligence is a field of computer science that focuses on creating and developing intelligent machines that can perform tasks that require intelligence similar to human

intelligence. It includes a set of technologies that aim to enable machines to perceive, think, learn and make decisions independently. At its core, artificial intelligence seeks to replicate and simulate human cognitive capabilities in machines, enabling them to understand, interpret and respond to their environment and data. Artificial intelligence has penetrated several applications in various fields, including natural language processing, computer vision, robotics and specialized systems, as it operates technologies such as voice assistants, self-driving cars and medical diagnostic tools. Artificial intelligence systems can also demonstrate human-like capabilities such as image recognition, understanding and generating natural language and playing games. [33]

*** Uses of Artificial Intelligence**

Artificial intelligence has penetrated many applications in various industries, changing the way humans live in the current era and how they interact with technology. The uses of artificial intelligence are diverse and continue to expand as technology develops. An example of these areas are:-

First, health care: Artificial intelligence has revolutionized the health field by assisting in diagnosis, treatment planning and patient care. Artificial intelligence algorithms can analyze medical images such as X-rays and magnetic resonance to detect abnormalities and assist radiologists in making accurate diagnoses. [34]

Second, finance: Artificial intelligence has transformed the finance industry by providing data-based insights, improving risk management, and simplifying operations. Artificial intelligence algorithms analyze huge amounts of financial data to discover patterns, predict market trends, and make correct investment decisions. Chatbots supported by artificial intelligence also work on Improve customer service by providing personalized recommendations, answering inquiries, and assisting with transactions

Third, transportation: Artificial intelligence is driving developments in transportation. With the development of self-driving cars, AI-powered systems are processing real-time data from sensors and cameras to navigate roads, detect obstacles and make decisions. [35]

Fourth, manufacturing: Artificial intelligence is revolutionizing manufacturing by automating processes, enhancing quality control and improving efficiency. AI-powered robots can perform complex tasks accurately and quickly, reducing errors and increasing production. Artificial intelligence algorithms also analyze sensor data to detect anomalies and predict equipment malfunctions.

Fifth, customer service: AI-powered chatbots and virtual assistants have transformed customer

service across industries as these intelligent systems can understand natural language, provide instant responses, and assist with queries

Sixth, education: Artificial intelligence is used in education to personalize learning experiences, provide smart tutoring, and support administrative tasks. AI-powered systems can adapt educational content to individual student needs, track progress, and provide targeted feedback. AI-equipped chatbots can help students with inquiries, provide clarifications, and facilitate interactive learning.

Seventh, cybersecurity: Artificial intelligence is increasingly being used in cybersecurity to detect and prevent cyber threats, as artificial intelligence algorithms can analyze network traffic, identify suspicious patterns, and detect potential security breaches. Artificial intelligence-powered systems can also learn from previous attacks to enhance threat detection capabilities and responding to it. [36]

These are just a few examples of a wide range of AI applications. As technology continues to advance, AI is likely to find more innovative uses that shape the future.

*** Harmful effects of artificial intelligence**

Artificial intelligence brings many benefits, but despite its benefits, it causes various harms such as unemployment, job displacement, bias, discrimination while taking continents, privacy and security risks, ethical considerations, dependency, control and unintended consequences. Retraining strategies and improving skills are needed to mitigate the effects of employment. Efforts must also be made to reduce bias, ensure fairness and maintain transparency in decision-making in the field of artificial intelligence. [37] Strong data protection measures are necessary to protect privacy. Ethical frameworks are crucial to guide the development of artificial intelligence. Balancing the capabilities of artificial intelligence and human supervision is extremely dangerous. It is necessary to conduct comprehensive tests and preventive measures to mitigate unintended consequences. Cooperation between researchers, policymakers, industry leaders and society is vital. Responsible development and continuous evaluation of artificial intelligence systems can increase benefits while reducing risks. [10]

*** Impact of Artificial Intelligence on Individuals and Societies**

Artificial intelligence is revolutionizing the current era by analyzing data, learning from patterns and making correct decisions. Its impact includes improving efficiency, automation and saving time for complex tasks. Artificial intelligence provides customized experiences and recommendations, which enhances user satisfaction. In the field of health care, artificial intelligence allows accurate diagnosis, personal

treatments and proactive health management. Although artificial intelligence may replace jobs, it promotes economic growth and innovation and provides new opportunities. Ethical considerations such as bias and privacy concerns arise, which requires justice, transparency and accountability. Artificial intelligence addresses societal challenges, improves accessibility, which benefits individuals with disabilities and contributes to finding solutions to global issues. [38]

*** Most affected countries by the use of artificial intelligence**

The use of artificial intelligence has a great impact on countries around the world as it transforms economies, industries and societies. Despite the different adoption of artificial intelligence and its impact, many countries stand out as being at the forefront of the development and use of artificial intelligence, including [39][40][41]:-

The United States has been a driving force in artificial intelligence research and innovation. Thanks to its famous universities, scientific research institutions, and thriving technology industry, the United States has produced pioneering developments in artificial intelligence technologies. Companies such as Google, Amazon, and Microsoft have invested heavily in artificial intelligence research and development, which has led to the creation of innovative artificial intelligence applications across various sectors from healthcare and finance to transportation and entertainment.	United States
China has emerged as a global leader in the development and implementation of artificial intelligence. The Chinese government has made artificial intelligence a national priority and invested heavily in research, infrastructure and talent development. Chinese technology giants such as Baidu, Alibaba and Tencent are leading the way in applying artificial intelligence to various sectors, including e-commerce, finance and transportation. China's huge population and digital market provide a unique testing ground for artificial intelligence technologies, leading to the rapid adoption of artificial intelligence and shaping its impact on society.	China
Canada has made great strides in AI research and is home to global institutions such as the Victor Institute and the Alberta Institute for Machine Intelligence. The Canadian government has actively supported AI initiatives and promoted collaboration between academia, industry and government. Canada's strong research ecosystem and talent pool have attracted major technology companies to establish AI research laboratories, contributing to the country's prominence in the development of AI.	Canada
The UK has a rich history of AI research and a thriving AI ecosystem where leading universities such as Oxford and Cambridge have made significant contributions to AI developments and the UK government has recognized the potential of AI, investing in R&D and promoting the adoption of AI in industries such as healthcare, finance and transport. London in particular has emerged as a hub for AI start-ups and innovation.	The United Kingdom
Germany is known for its engineering and manufacturing prowess and has adopted artificial intelligence to drive industry and innovation. The German government has launched initiatives to support research and development in the field of artificial intelligence, especially in areas such as self-driving vehicles, robotics and industrial automation. German companies, including car manufacturers and technology companies, benefit from artificial intelligence to enhance manufacturing processes, improve logistics and develop smart infrastructure.	Germany
South Korea has made significant investments in AI research, development and infrastructure. The government's AI strategy aims to make the country a global hub for AI. South Korea's robust IT industry and advanced telecommunications infrastructure create fertile ground for AI adoption. The country is particularly focused on AI applications in robotics, autonomous vehicles and smart cities.	South Korea

(Table 1)

However, the impact of artificial intelligence extends beyond these countries as many other countries, including Japan, France and India, actively adopt artificial intelligence and test its effects on their economies and societies as artificial intelligence continues to advance and its impact will continue to shape countries around the world,

affecting innovation, economic growth and societal transformation.

*** Countries that have taken a step in reducing the harms of using artificial intelligence**

As the use of AI expands, concerns surrounding potential harms and risks have led many countries to take steps to mitigate these issues. Recognizing the importance of developing and deploying AI responsibly, governments around the world are implementing regulations, guidelines and initiatives to reduce the potential negative impacts of AI, for example:-

1- European Union: The EU was at the forefront of regulating AI and its ethics in April 2021. The EU issued a proposed regulation known as the Artificial Intelligence Act, which aims to ensure the ethical and responsible use of AI. The law prohibits some AI practices that pose risks to fundamental rights, such as social registration and AI systems that manipulate human behavior. It also defines the requirements for high-risk AI applications, including transparency, human control and data management. [39]

2- United States: The United States began taking steps to address ethical and safety concerns surrounding artificial intelligence in 2019, as the National Institute of Standards and Technology (NIST) issued a plan to develop artificial intelligence standards, focusing on areas such as explainability, transparency, and accountability. In addition, multiple mandates submitted including California and Illinois have passed legislation to regulate artificial intelligence technologies, especially in areas such as facial recognition and automated decision-making.

3- Canada: Canada has been a pioneer in addressing AI ethics and developing AI responsibly. In 2017, the Canadian government established the Pan-Canadian AI Strategy to promote AI research, talent development, and ethical AI adoption. Canada's AI research institutes emphasize the example of the Victor Institute and the Montreal Institute for Learning Algorithms MILA on the importance of ethical considerations in AI research and encourage responsible AI practices. [41]

4- Finland: Finland has taken notable steps to address the ethical implications of artificial intelligence. In 2019, the Finnish government published the Ethical Guidelines for Trustworthy Artificial Intelligence, which provide a framework for the development and deployment of AI systems based on principles such as transparency, accountability and human-centricity. Finland is promoting cooperation between industry, academia and government to ensure the responsible development and deployment of AI.

5- Singapore: Singapore has developed a comprehensive approach to AI governance and ethics. The government established the Advisory Council on the Ethical Use of AI and

Data, which issued a model framework for AI governance in 2019. This framework provides guidance to organizations on responsible adoption of AI and covers aspects such as fairness, transparency and accountability. It emphasizes Singapore's approach emphasizes the importance of human oversight, data privacy and continuous monitoring of artificial intelligence systems. [42]

6- United Kingdom: The United Kingdom has prioritized the development of ethical AI and accountability. In 2018, the UK government issued the Artificial Intelligence Sector Deal and established a Data Ethics and Innovation Centre. These initiatives focus on promoting the ethical deployment of AI, ensuring transparency and enhancing public trust. The UK also encourages the adoption of ethical frameworks and guidelines by industry to address the risks and harms associated with AI. [39]

*** What are the legal bases for liability resulting from the damage caused by the use of artificial intelligence?**

The legal basis for liability arising from damage caused by artificial intelligence is complex and evolving with the increasing independence of artificial intelligence. Questions are raised about liability for damage caused by artificial intelligence systems. The main legal causes of liability include negligence. Failure to meet industry standards or properly train and maintain artificial intelligence systems may lead to liability. Product liability laws may be applied if an artificial intelligence system is considered productive, making manufacturers and distributors liable for defects. [6] Strict liability is discussed regardless of error or negligence. For artificial intelligence systems, contractual liability arises from agreements that specify responsibilities and obligations related to artificial intelligence. Violation of intellectual property can lead to legal action if artificial intelligence systems violate copyrights, patents, trademarks or trade secrets. Regulatory compliance is gaining increasing importance as regulations impose obligations and standards for the development and use of artificial intelligence. It is important to note that the legal bases for artificial intelligence liability are evolving. Specific considerations may vary by jurisdiction, type of damage, nature of the artificial intelligence system, and party roles. [30]

*** The emergence of the legal bases for liability resulting from the damage caused by the use of artificial intelligence**

The legal basis for liability arising from damage resulting from the use of artificial intelligence is a complex and sophisticated legal field. With the advancement of artificial intelligence technology and its

greater integration into society, questions related to liability have become increasingly important. Here we explore the main factors that contribute to the emergence of the legal basis for artificial intelligence liability. Artificial intelligence poses unique challenges that traditional legal frameworks may not be able to adequately address. The independent nature of artificial intelligence systems and their ability to make independent decisions raises questions about how to distribute responsibility in cases of damage. Courts and legislators struggle with these challenges and work to adapt existing laws or develop new legal principles to take into account the distinctive characteristics of artificial intelligence. [30]

AI systems also have the potential to cause harm in various ways, including privacy violations, misuse of data, bodily injury or financial loss. High-profile incidents involving AI, such as incidents involving self-driving cars or biased decision-making algorithms, have been highlighted. Recognition of the significant impact that AI can have on individuals, businesses and society has prompted the exploration of legal avenues to address these harms. Judicial decisions and legal precedents play a critical role in shaping the legal basis for AI liability. Since AI-related cases are brought before the courts, judges are tasked with determining liability by applying existing legal principles such as negligence or product liability to specific AI contexts. These legal precedents contribute to the development of a legal framework that can accommodate the complexities and nuances of AI technologies. Governments and regulators are actively involved in discussions and the implementation of regulations to address the potential harms of AI and establish liability frameworks. Some jurisdictions have introduced laws or guidelines for AI systems with the aim of ensuring safety and justice. Accountability these legislative efforts provide a basis for assigning responsibility and encouraging the responsible development and use of AI. [17] The ethical considerations surrounding AI have also played a role in shaping the legal basis of liability. Principles such as transparency, fairness and interpretability are increasingly recognized as important factors in determining liability for AI-related harms. The integration of ethical guidelines and frameworks into legal discussions may help to establish a more comprehensive approach to AI liability. Taking into account the legal and ethical dimensions, the global nature of AI and its potential impact on cross-border activities requires international cooperation in developing legal frameworks for AI liability. Organizations such as the United Nations and the European Union are actively working on initiatives and guidelines to promote

international cooperation and harmonization of AI laws. [30]

*** Societies supporting the legal bases of liability resulting from the damage caused by the use of artificial intelligence**

Recognizing the need to address the potential risks and harms associated with AI technologies, many countries and communities are actively supporting the legal basis for AI harm liability. These communities may take steps to establish clear legal frameworks and promote accountability. An example of countries that support the legal basis for AI harm liability is [30]:-

1- European Union: The European Union has been at the forefront of regulating AI and has stressed the importance of responsibility. The proposed AI law aims to establish a legal framework that ensures accountability for AI-related harms. It sets out provisions for limiting responsibility, including compliance with safety requirements, appropriate risk assessments and the obligation to keep records. The EU approach reflects the commitment to protect individuals and companies while promoting the responsible development and deployment of AI. [44]

2- United States: Many stakeholders are calling for a legal basis for AI liability as researchers, policymakers, and industry leaders recognize the need for legal frameworks that address the potential harms of AI. Although no comprehensive federal legislation has been enacted, discussions are underway at the state and federal levels to explore liability frameworks and establish rules surrounding AI accountability. [45]

3- Canada: Canada has demonstrated a commitment to upholding the legal basis for AI responsibility. The country has been proactive in addressing the ethical implications of AI and has stressed the importance of accountability. Canada's approach focuses on the responsible development and deployment of AI, which includes consideration of liability issues. The government encourages the adoption of ethical guidelines and frameworks that promote transparency, fairness and accountability in AI systems. [46]

4- United Kingdom: The UK has recognized the importance of creating a legal basis for AI responsibility as the Centre for Data Ethics and Innovation, a UK government advisory body, has conducted research and made recommendations on AI accountability and the UK is actively developing regulations and guidelines that address the potential risks and harms associated with AI. [45]

5- In addition to international cooperation, where many international organizations and associations are working to establish a legal basis for AI responsibility, the Institute of Electrical and Electronics Engineers (IEEE) and the International Organization for Standardization (ISO) are developing

guidelines and standards that address responsibility and accountability in AI systems. These collaborative efforts aim to enhance global cooperation and promote consistent approaches to AI responsibility. [40]

Because the legal basis of AI responsibility is a dynamic field and as AI technologies continue to evolve and have an increasing impact, the need for clear and robust legal frameworks will continue as countries and communities that support the legal basis of AI responsibility reflect their commitment to ensuring the responsible development of AI, protecting the rights of individuals, and mitigating potential harms through the establishment of legal frameworks, enhancing international cooperation, and enhancing accountability. When comparing the legal bases of liability for damage resulting from the use of AI, many countries stand out because of their unique approaches and legal frameworks, for example [41][42][44][45][46]:-

China	Russia	Canada	The United States	The United Kingdom
China has emerged as a global leader in AI development with significant government support and investment. The Chinese government has made AI a national priority with a focus on research, infrastructure and talent development. China's legal framework regarding AI liability may evolve as guidelines and regulations are put in place to address potential risks and harms.	Russia has shown interest in developing AI and has begun taking steps to address related legal issues. The Russian government is working to establish regulations governing the development, deployment, and responsibility of artificial intelligence. However, specific details about the legal basis for AI liability in Russia are still evolving and the state is constantly improving its approach	Canada prioritizes responsible AI development and emphasizes the importance of accountability as the Canadian government has created the All-Canada AI Strategy to promote AI research and talent development, and embrace ethical AI. Canada also encourages the adoption of guidelines and ethical frameworks that promote transparency, fairness and accountability in AI systems	The United States takes a decentralized approach to AI responsibility, with different regulations at the state level. The National Institute of Standards and Technology (NIST) has issued a plan to develop AI standards, including considerations of transparency, interpretability and accountability	The UK emphasizes the importance of transparency, accountability and responsible use of AI. The Center for Data Ethics and Innovation provides guidance on AI accountability and is working on regulations to address potential risks and harms. The legal framework in the UK includes existing laws such as negligence and product liability

(Table 2)

It is important to note that the legal foundations for AI liability continue to evolve rapidly in all these countries as ongoing legislative efforts, court decisions, and international cooperation play an important role in shaping the legal frameworks surrounding AI liability and each country has its own unique approach that is influenced by cultural, political, and legal factors. As AI technologies advance, these countries will continue to improve their legal foundations to address the complexities and challenges of AI-related harms and ensure the responsible use of AI

*** Literature Review**

The determination of responsibility for damage caused by

artificial intelligence is clear when it concerns a small number of stakeholders or when the decisions taken by artificial intelligence are determined, as it can only make a limited set of decisions according to what is determined by the human programmer. [1] The use of artificial intelligence often leads to the problem of ethical choice and raises legal issues that require immediate intervention. [2]An example of this includes the main challenges facing artificial intelligence systems in the field of healthcare has inherent challenges in machine learning, logistical difficulties in implementation, consideration of barriers to its adoption, and sociocultural changes. [4] Huge advances in artificial intelligence, machine learning, robotics, and automation are rapidly transforming industries and societies around the world, and the way we work, live, and interact with others is expected to change. [3] The emerging discipline of artificial intelligence has changed attitudes toward the mind, which has long been seen as a trait belonging exclusively to biological organisms, Homo sapiens. 1956 when the concept of artificial intelligence emerged, discussions began about whether the mind was more than a trait inherent in a biological organism. [6]Despite the benefits of artificial intelligence, artificial intelligence often includes many stakeholders and components (such as sensors, hardware, software, applications, the data itself, data services and communication features), and these modern forms of artificial intelligence are increasingly able to learn without human supervision, making it difficult to distribute responsibility among all owners. [1] Major disruptions are expected to occur in our way of life and societal norms, as the opportunity to understand the impact of these technologies and anticipate their negative effects is rapidly diminishing and humanity must be proactive and not just reactive. [3]Therefore, by studying the social aspects of artificial intelligence, the main characteristics of artificial intelligence that carry criminal risks have been identified, and the types of criminal risks of using artificial intelligence have been identified. [2]There is increasing interest in the market potential of artificial intelligence technologies and applications, as well as the potential risks that these technologies may pose. As a result, questions are raised about the legal and regulatory governance of artificial intelligence, machine learning and robotic technologies. Fearing the effects of the labor market and social inequality [5]From the study, the factors that lead to the occurrence of harm confirm that the work of artificial intelligence depends on the pursuit of goals, and this means that artificial intelligence through its actions may cause harm for one reason or another, so compensation issues must be

addressed in accordance with the existing legal provisions, but here the main issue is that neither national law nor international law Artificial intelligence is recognized as a subject of law, which means that artificial intelligence cannot be held personally responsible for the damage it causes. In the absence of direct legal regulation of artificial intelligence, Article 12 of the United Nations Convention on the Use of Electronic Communications in International Contracts can be applied, which states that a person (whether a natural person or a legal entity) on whose behalf a computer has been created, the programmer must ultimately be responsible for any message generated by the device. This interpretation corresponds to a general rule that the tool manager is responsible for the results obtained. [6] A clear, strict and effective definition of ethical frameworks in the development, design, production, use and modification of artificial intelligence must be Arguments are made about the need to recognize artificial intelligence as a source of increased risk. According to the content of the European Parliament resolution on the possibility of granting artificial intelligence "legal status", special attention is paid to the issue of giving artificial intelligence personality. It is proposed to use legal fiction as a method through which the specific legal personality of artificial intelligence can be considered as a non-standard legal position that differs from reality. It is assumed that such a decision can remove a number of legal restrictions that exist today and prevent the active participation of artificial intelligence in the legal field. [2]Therefore, the developers of artificial intelligence algorithms must be vigilant to the potential risks and unintended negative consequences of new algorithms[4] .

*** Results**

The study reached the following results:-

First: Classifying countries in descending order according to the greatest harm caused by the use of artificial intelligence according to the researchers' study as follows:-

1- China: China's large investments in AI and its widespread deployment of AI technologies have raised concerns about issues such as breaches of privacy, surveillance and state control, and the country's dominance of global steel production and other key sectors has had an impact on international markets, potentially affecting other countries' industries.

2- United States: It has a strong presence in AI research, development and application while the country has made significant progress in AI

3- Germany: Germany's focus on artificial intelligence in manufacturing and automation has the potential to disrupt industries and impact employment. The country's strong manufacturing sector combined with advances in artificial intelligence could lead to significant

changes in the workforce and potentially job displacement.

4- United Kingdom: The UK's focus on AI ethics and responsible AI deployment suggests a proactive approach to mitigating potential harm, though the impact of AI on privacy, surveillance and algorithmic bias remain challenges.

5- South Korea: South Korea's progress in adopting and integrating AI in various sectors may have implications for employment and societal changes

6- Canada: Although Canada has made great strides in artificial intelligence research and development, the available information does not indicate significant harm from its use. However, the impact of artificial intelligence on privacy, bias and employment may still be relevant.

Second: Most countries have taken a step in reducing the damage caused by the use of artificial intelligence

Based on the comparative study conducted by the researchers, they concluded that the United States under the Biden-Harris administration has taken steps to address the potential harms of artificial intelligence. They have held meetings with the CEOs of artificial intelligence companies to emphasize responsible and ethical innovation. The administration has published a blueprint for an artificial intelligence bill of rights to protect the rights and safety of Americans, while government agencies have intensified their efforts to prevent algorithmic bias and protect individuals from harmful outcomes.

Third: The best society in favor of the legal bases for liability resulting from the damage caused by the use of artificial intelligence

Based on the comparative study carried out by the researchers, they concluded that it is worth mentioning the United Kingdom and the United States, where both countries have actively participated in discussions and initiatives related to the ethics of artificial intelligence and its responsible dissemination. Both countries have established frameworks and guidelines to address the ethical and legal implications of artificial intelligence, including liability issues. The United Kingdom, for example, has emphasized the ethics of artificial intelligence and the responsible development of artificial intelligence, while the United States has published a blueprint for an artificial intelligence bill of rights to protect the rights and safety of individuals.

*** Conclusion**

This comparative study highlighted the countries in descending order on the basis of the greatest damage caused by the use of artificial intelligence, as follows: China, the United States, Germany, the United Kingdom, South Korea, and Canada. The United States also stands out as the country that has taken important steps to reduce the

damage associated with artificial intelligence. It was concluded that both the United States and the United Kingdom are the best supportive societies when it comes to the legal foundations of responsibility resulting from the use of artificial intelligence. These countries have shown proactive efforts in addressing the ethics of artificial intelligence and its responsible deployment, which reflects their commitment to mitigating potential damage and ensuring accountability.

*** Recommendations**

The study reached some recommendations to address responsibility in the context of artificial intelligence technologies, including:-

1- Governments should proactively develop and update legal frameworks that clearly define responsibility in the context of AI technologies

2- Consideration should be given to creating AI-specific liability laws that take into account the unique characteristics and challenges associated with AI technologies

3- Encourage industry standards and best practices

4- Encourage AI developers and organizations to ensure transparency and explainability in their AI systems.

5- Ensure data privacy, data security and compliance with relevant data protection regulations

6- Document the decision-making process of AI algorithms, provide clear explanations of the resulting results, and uncover any potential limitations or biases associated with the technology.

7- Encourage the exchange of information, experiences and best practices to develop a collective understanding of the legal implications and challenges related to AI liability

8- Establish mechanisms to provide individuals affected by AI-related harms with effective and accessible channels for seeking redress

9- Regularly review and update legal frameworks and policies on AI responsibility to keep pace with technological progress

*** Confession**

The researchers declare that there is no conflict of interest

*** References**

Benhamou, Y., & Ferland, J. (2020). Artificial intelligence & damages: assessing liability and calculating the damages. Leading Legal Disruption: Artificial Intelligence and a Toolkit for Lawyers and the Law, Forthcoming.

Bikeev, I., Kabanov, P., Begishev, I., & Khisamova, Z. (2019, December). Criminological risks and legal aspects of artificial intelligence implementation. In Proceedings of the International Conference on Artificial Intelligence, Information Processing and Cloud Computing (pp. 1-7).

Wang, W., & Siau, K. (2019). Artificial intelligence, machine learning, automation, robotics, future of work and future of humanity: A review and research agenda. Journal of Database Management (JDM), 30(1), 61-79.

Kelly, C. J., Karthikesalingam, A., Suleyman, M., Corrado, G., & King, D. (2019). Key challenges for delivering clinical impact with artificial intelligence. BMC medicine, 17, 1-9.

Thierer, A. D., Castillo O'Sullivan, A., & Russell, R. (2017). Artificial intelligence and public policy. Mercatus Research Paper.

Čerka, P., Grigienė, J., & Sirbikytė, G. (2015). Liability for damages caused by artificial intelligence. Computer law & security review, 31(3), 376-389.

7Kingston, J. K. (2016). Artificial intelligence and legal liability. In Research and Development in Intelligent Systems XXXIII: Incorporating Applications and Innovations in Intelligent Systems XXIV 33 (pp. 269-279). Springer International Publishing.