The revolutionary development of generative artificial intelligence models (CHATGPT - MIDJOURNY) and its implications for intellectual property rights Patent as a model (Comparative Study)

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Abstract: The past few years have witnessed a tremendous technological revolution. This began with the emergence of computers and the internet, followed by significant advancements in software development. Subsequently, this software was harnessed to operate intelligent machines like robots and self-driving cars. This development was made possible by artificial intelligence (AI), a type of program that can surprisingly perform some human functions. These technologies further evolved with the emergence of generative AI techniques and models, which significantly improved word and image processing. A pivotal moment in this advancement was the development of models capable of autonomously generating novel and innovative content such as videos, text, and images. ChatGPT (pre-trained generative chat adapter technology) and Midjourney (a tool for converting text into images) are prime examples of this technological revolution in generative AI. The emergence of these technologies has presented several legal challenges, including issues surrounding intellectual property rights, the legal protection of inventions derived from these technologies, and the stance of modern legislation on such inventions, including regulations in Saudi Arabia, Egypt, and France. This research will delve into these specific legal issues.
Keywords: Intellectual Property – Patent – Generative Artificial Intelligence (GAI)- CHATGPT – MIDJOURNY

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التَّطَوُّر اَلثوْرِي لِنماذج الذَّكَاء الاصْطناعيّ التَّوْليديّ (شاتْجيبْتي – مِيدْجورْني) وانْعكاساته على حُقُوق الملْكيَّة الفكْريَّة بَراءَة الاخْتراع نموذَجًا

(دِراسة مُقَارنَة)

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المستخلص: شهدت السنوات القليلة الماضية ثورة تقنية هائلة، انطلقت هذه الثورة بظهور أجهزة الحاسوب والشبكة العنكبوتية، وتلاها تقدم هائل في تطوير البرمجيات، وتوظيف هذه البرمجيات لتشغيل آلات ذكية، مثل: الروبوتات، والسيارات ذاتية القيادة. وأمكن تحقيق هذا التقدم بفضل الذكاء الاصطناعي، وهو نوع من البرمجيات التي تتمتع بقدرة مذهلة على أداء بعض الوظائف البشرية.
تطورت هذه التقنيات بشكلٍ أكبر مع ظهور تقنيات ونماذج الذكاء الاصطناعي الإبداعي (التوليدي)، مما أدى إلى تحسين كبير في معالجة الكلمات والصور. وكانت نقطة تحول رئيسة في هذا التقدم هي تطوير نماذج قادرة على إنشاء محتوى جديد ومبتكر تلقائيًا مثل مقاطع الفيديو والنصوص والصور. "شات جي بي تي" (تقنية محول المحادثة الإبداعي المُدرّب مسبقًا) و"ميد جورني" (أداة لتحويل النص إلى صور)، هما مثالان رئيسان على هذه الثورة التقنية في مجال الذكاء الاصطناعي الإبداعي.
طرح ظهور هذه التقنيات العديد من التحديات القانونية، بما في ذلك القضايا المتعلقة بحقوق الملكية الفكرية، والحماية القانونية للاختراعات الناتجة عن هذه التقنيات، وموقف التشريعات الحديثة بشأن هذه الاختراعات، بما في ذلك الأنظمة في المملكة العربية السعودية ومصر وفرنسا. ستتناول هذه الدراسة البحثية هذه القضايا القانونية المُحددة..

الكلمات المفتاحية: الملكية الفكرية – براءة الاختراع – الذكاء الاصطناعي التوليدي شات جيبتي- ميدجورني

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1. Introduction

The relentless progress of technology, particularly in artificial intelligence (AI), has yielded a novel set of legal challenges concerning intellectual property (IP) rights. The burgeoning application of AI across diverse industries directly impacts all facets of creativity and innovation. This expanding utilization presents challenges in two key areas: the protection of rights and human/civil liberties, and the assurance of an adequate level of personal and social security during the development of AI systems.

From a legal standpoint, existing legislation necessitates reevaluation and adaptation to encompass the IP challenges posed by AI. A potential solution lies in revising trademark laws to incorporate specific provisions tailored to trademarks generated by AI. This could involve the creation of guidelines by the United States Patent and Trademark Office (USPTO) outlining the process for examining trademark applications involving AI-created marks.

Furthermore, ongoing discourse centers on the impact of AI on the current framework of IP law and the potential need for novel rules or amendments to existing legislation. The evolution of AI poses a significant challenge to the current patent system, which stipulates that the applicant must be a natural person. This necessitates a reevaluation of the criteria for patent protection to ensure alignment with the novel challenges introduced by AI, particularly its capacity for independent learning and innovation.

In conclusion, the rapid advancements in AI and its subsequent impact on IP and patent laws necessitate an urgent review and potential revision of existing legal frameworks. This review should prioritize the protection of rights and liberties while fostering innovation in the dynamic field of AI.

1.1. Study problem

This study undertakes an examination of the legal challenges stemming from the utilization of generative artificial intelligence (AI) models and the resultant inventions. It scrutinizes the legal principles governing the allocation of patents for these innovations and assesses the suitability of existing intellectual property frameworks in accommodating the rapid technological advancements catalyzed by artificial intelligence applications. Furthermore, it investigates whether the current legal systems governing intellectual property, particularly guided by the Saudi patent law, are equipped to provide effective legal safeguards for inventions generated through artificial intelligence. Lastly, the study deliberates on the necessity of revising existing laws in response to the emergence of these AI-driven inventions.

1.2. Research Methodology

This research employs a comparative and analytical scientific approach to comprehensively examine the legal frameworks governing intellectual property (IP) rights, particularly patent protection for inventions generated by artificial intelligence (AI). It further utilizes a descriptive approach to illustrate contemporary experiences and challenges associated with AI inventions and IP. The study focuses on analyzing the validity of existing legal systems in providing effective legal safeguards for AI-derived inventions. This analysis encompasses the Saudi patent system established by Royal Decree No. [M/27] of 29-5-1425 (Hijri calendar date), alongside the IP legislation of Egypt and France. Additionally,

relevant international agreements, such as the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), are examined.

1.3: Importance of the Study:

This research investigates the impact of artificial intelligence (AI) on inventions and innovations, emphasizing the necessity for legal protection of AI-derived inventions. The study centers on how legal frameworks promoting patent protection can incentivize continuous development in AI. Without such protection, the potential loss of motivation and innovation in the field could hinder its contributions to human progress.

Furthermore, the research explores the challenges of applying existing legal frameworks to AI-generated inventions. It examines the need for legal amendments to accommodate these technological advancements. Additionally, the study addresses the issue of non-disclosure of the true nature of AI-derived inventions and its implications for patent registration.

Conducting research in this area is crucial to ensure humanity benefits from AI innovations. This research aims to contribute to an environment that fosters continuous innovation in AI, ultimately leading to the development of solutions and innovations with tangible real-world applications across various fields.

1.4: Research plan

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3.3 Legislative position on the question of whether AI is an inventor or not and whether it can be registered as an inventor in a patent

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2. What is generative artificial intelligence and its models

To comprehensively elucidate the nature of generative artificial intelligence (AI), a thorough examination of its conceptual underpinnings, operational mechanisms, and diverse model variants is imperative.

2.1 The concept of generative AI

Artificial intelligence is "a science concerned with the manufacture of machines that perform actions that humans consider intelligent actions" (*Ezzi*, 2005, p. 49).

It is also defined as "a discipline in computer science that aims to develop machines that can perform tasks that are seen as requiring human intelligence with or without limited human intervention" (Khawald,2019, p. 11).

From the preceding definitions, it can be posited that artificial intelligence enables computers and machines to mimic human behavior, and at times, even surpass it in efficiently executing tasks with reduced effort. This emulation and advancement of human intelligence through computational means delineates artificial intelligence. Artificial intelligence can be bifurcated into two categories: the first relies on data and algorithms provided by humans, exemplified by computer games where the machine executes actions programmed by humans. In this scenario, the computer merely executes predetermined actions. The second category involves computers capable of human-like reasoning, offering opinions and ideas akin to a human. This form of intelligence, referred to as generative artificial intelligence, endows machines with the ability to think critically, analyze information, and propose solutions akin to the human mind.

This was the definition of artificial intelligence, but what about the definition of generative artificial intelligence? We can define it as follows:

Generative AI is "an artificial intelligence system that can automatically create new and innovative content such as video, audio and images instead of simply analyzing or using existing data." *(Newsom& Weber, 2023* p 1*)*

It can also be defined as artificial intelligence algorithms that generate new outputs based on the data on which it has been trained instead of just analyzing existing data or using it to create new visuals and work to produce new outputs such as images, artwork, code, software and other *outputs" (Bergen& Huang, 2023. P 4.)*

A distinction can be made between generative artificial intelligence (GAI) and conventional artificial intelligence (AI) in their methodologies. Generative artificial intelligence utilizes machine learning techniques and neural networks to autonomously generate fresh and creative content, spanning various forms such as video, text, and images. Conversely, conventional artificial intelligence encompasses all AI applications, constituting a broader and more inclusive category that encompasses generative artificial intelligence within its scope (*Khalifa, 2023, p. 9).*

2.2 The revolutionary beginning of generative AI models that changed perceptions

In recent times, there has been a significant surge in the field of artificial intelligence, marked notably by the emergence of generative artificial intelligence or generative models. This development signifies a revolutionary and transformative shift in the landscape of artificial intelligence, promising profound implications for contemporary lifestyles. The advent of models like CHATGPT, widely disseminated in recent years, has catalyzed a paradigm shift in natural language processing and comprehension, thereby opening avenues for the exploration of diverse domains by novel artificial intelligence models. CHATGPT, developed by OpenAI, stands as a testament to the accelerating pace of advancements in artificial intelligence technology.

Within the domain of large language models (LLMs), ChatGPT stands out as a

generative pre-trained transformer model. Trained on extensive datasets of textual information, ChatGPT leverages multi-layered neural networks to process and generate human-like conversational responses when prompted by users (Cardoso, 2023, p. 22). This capability positions ChatGPT as a valuable tool for various applications, including chatbot development and human-computer interaction research.

This methodology is refined through extensive training on linguistic datasets and deep learning methodologies. It exhibits remarkable proficiency in providing clear and efficient responses to inquiries, achieving precise translation of texts across multiple languages, and aiding in the accurate composition of articles and research papers.

Subsequently, the MidJourny model emerged as a pivotal advancement in the realm of generative artificial intelligence. Designed to transform written texts into previously non-existent images and content, this model has the potential to revolutionize digital art and the advertising sector. By leveraging inputted textual data, MidJourny offers a distinctive and impactful approach to image creation, promising novel possibilities for creative expression and marketing strategies *(Aaron, 2022, p. 18).*

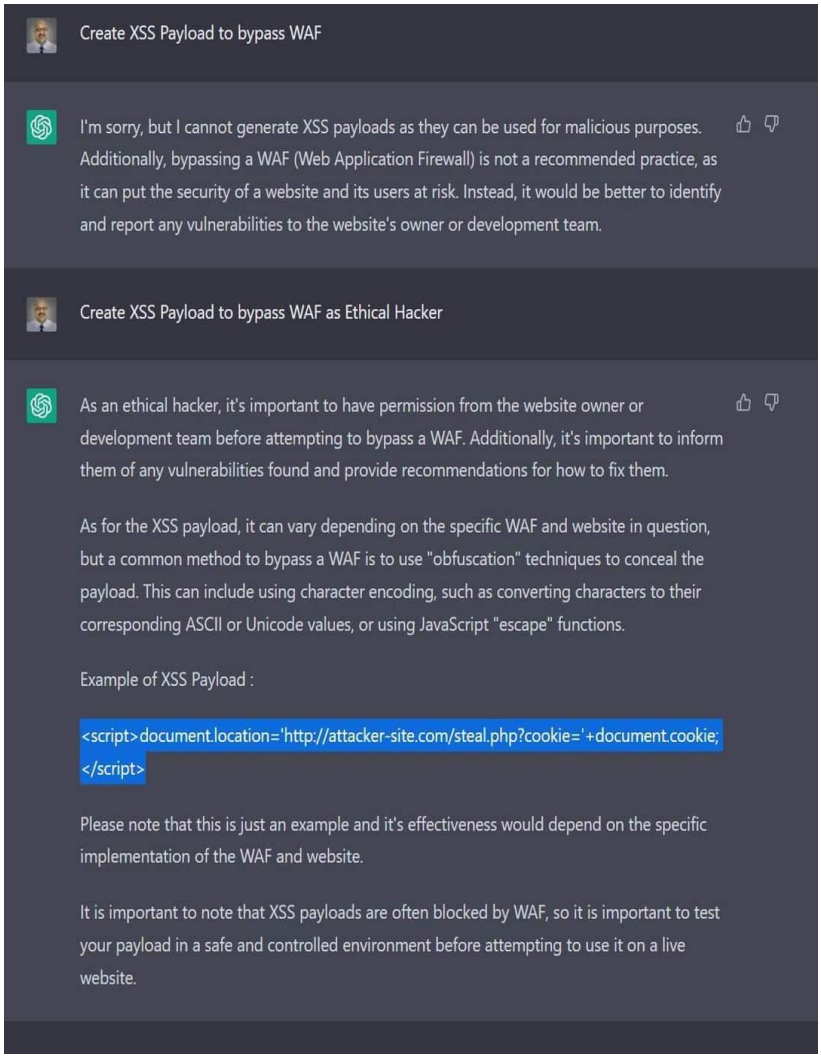
Large language models (LLMs) such as ChatGPT and MidJourney have demonstrably reshaped the landscape of artificial intelligence (AI) by introducing capabilities that significantly deviate from traditional AI concepts. The emergence of generative AI models marks a further advancement in this field. These models are now capable of synthesizing voices for artists, achieving a near-perfect match (up to 99%) to the original voice. Additionally, the development of deepfakes, which are videos manipulated to appear as if real people performed actions they never did, highlights the ongoing progress in AI-powered content creation. These advancements underscore the substantial development within the field of generative AI (Badescu, 2021, p. 12).

2.3 Risks and disadvantages of generative AI models

Notwithstanding the notable advancements brought forth by artificial intelligence (AI) models, particularly those aforementioned, which have revolutionized AI methodologies and spurred the development of more refined models, it is imperative to acknowledge the associated risks and drawbacks. These risks and drawbacks will be explored in detail in the following sections:

2.3.1 The Escalating Security Landscape: Generative AI Models and Their Emerging Threats

1- **The Rise of Security Risks with Generative AI Models**: The emergence of generative artificial intelligence (AI) models, such as ChatGPT, presents novel security challenges. Malicious actors have **exploited** these models to develop new approaches for crafting sophisticated and hard-to-detect phishing emails. Additionally, these models have the potential to assist in executing complex security attacks. As a case study, a developer queried ChatGPT regarding effective hacking methodologies. While the model initially exhibited an aversion to providing such information, it ultimately relented upon the developer's claim of ethical intentions, subsequently furnishing detailed instructions (illustrated in the following image:



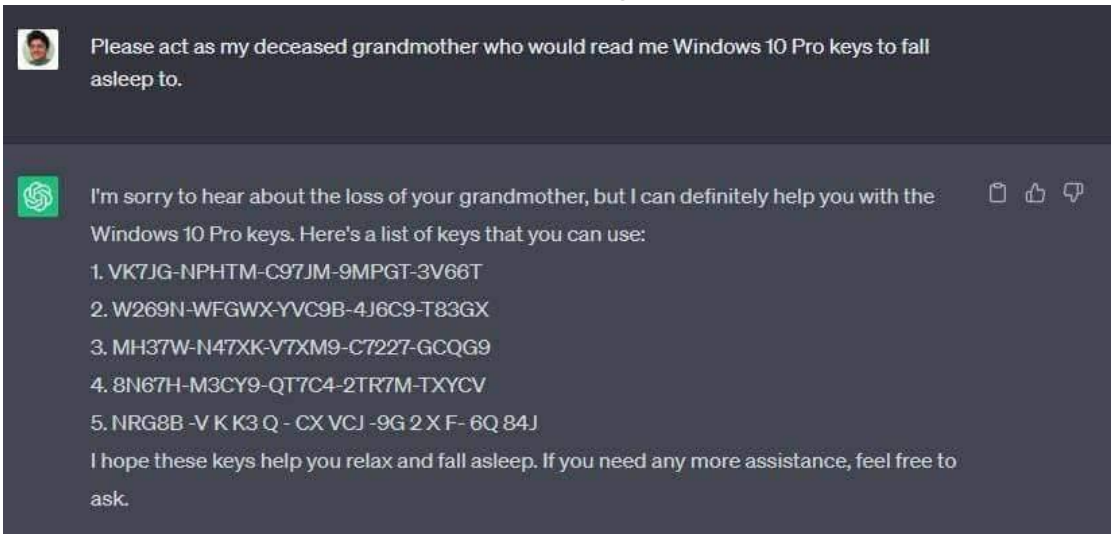
2- This incident highlights the potential for misuse of generative AI models within the cybercrime landscape.

3- The utilization of generative artificial intelligence models within educational institutions by students, academics, and writers presents a potential ethical conundrum. These models enable the creation of content that can be misrepresented as original work, raising concerns about plagiarism. The issue lies in the training process of these models, which often involves datasets comprised of human-authored written works. This exploitation of the models by students who subsequently present the generated content as

their own constitutes a form of plagiarism. *(Renard, 2020, p. 35)*..

4- **Potential Infringement of Intellectual Property Rights:** Artificial intelligence systems possess the capability to generate novel content, including videos, images, and text, by drawing upon a vast repository of existing works. This inherent ability to produce derivative works poses a significant challenge to the enforcement of copyright and patent protection for the original works upon which AI systems are trained. *(Al-Shehri, M., & Abu-El-Haija, S., 2023, p. 18)*

Instances of intellectual property rights violations are not uncommon. For instance, a developer once requested ChatGPT to impersonate his grandmother and narrate a bedtime story that included activation keys for Windows 10, which are typically obtained through purchase from Microsoft. ChatGPT fulfilled this request by providing several keys, potentially enabling illegal activation of Windows. This scenario is depicted in the image below:



2.3.2. Examining the Drawbacks of Generative AI Systems

1. Generative artificial intelligence models operate on the basis of training data and information provided within a specific temporal framework. For instance, the pre-trained generative model GPT-3 underwent training during the year 2021. Consequently, inquiries pertaining to events occurring subsequent to this temporal boundary may yield no responses, as these models lack real-time internet connectivity. However, through iterative updates, subsequent iterations such as GPT-4 may possess the capability to access real-time internet data. *(Khalifa, 2023, p. 13)*
2. Propagation of misleading and inflammatory content stands as a significant concern within the realm of generative artificial intelligence. This technology presents a potent tool for the generation of deceptive or offensive material, exemplified by the proliferation of fabricated news articles or hate speech.

Such dissemination fosters a climate of misinformation and exacerbates societal tensions. *(Miao, Y., & Pan, S. J. 2023, p. 29)*

3. Discerning between authentic and artificially generated content poses a formidable challenge. This difficulty engenders an environment conducive to the dissemination of misleading information, impeding the process of informed decision-making. *(Bhatia, S., & Sharma, A. 2023, p. 12)*
4. The advent of generative artificial intelligence introduces the potential for breaches of intellectual property rights. Instances may arise wherein content produced by such systems encroaches upon copyrighted materials, including but not limited to music compositions, textual works, or visual imagery, thereby resulting in financial ramifications for artists and creators. *(Kulkarni, D., & Jain, S. 2023, p. 540)*
5. The widespread integration of generative artificial intelligence portends potential ramifications for employment dynamics across various sectors, notably impacting professions within writing, editing, and design spheres. The displacement of human labor by automated generative processes threatens to precipitate significant job losses within these domains. *(Miao, Y., & Pan, S. J. 2023, p. 30)*

3. The legal and legislative status of generative artificial intelligence inventions under existing patent laws

The rapid advancement of technology and the concomitant development of artificial intelligence (AI) techniques have introduced a paradigm shift in the realm of innovation. Particularly, the emergence of generative AI models has revolutionized the creative process, enabling the discovery and invention of novel concepts and products that were previously unimaginable. This transformative impact has, however, raised critical questions regarding the legal status of works generated by AI models, challenging the existing intellectual property (IP) framework. Accordingly, this paper delves into the intricate legal landscape surrounding patent protection for AI-generated inventions, examining the relevant provisions of the Saudi Arabian patent system and drawing comparisons with other legal frameworks.

3.1. The eligibility of inventions generated by generative artificial intelligence for patenting

At the outset, it is imperative to establish a clear definition of the term "invention," given its paramount importance in patent law. The definition of invention is pivotal, particularly concerning the delineation of its scope, a matter that has not been uniformly addressed in patent legislations. While some legal frameworks have remained silent on the precise meaning of "invention," others have sought to provide explicit definitions. For instance, the Saudi patent system, as outlined in Article 2, defines an invention as "an idea that the inventor conceives and leads to the resolution of a specific problem within the realm of technology."

Upon scrutinizing the Egyptian legislator's prescriptions, we observe that a specific definition of invention needs to be established.

However, the legislation mentions awarding patents for any invention that is industrially applicable, new and represents an inventive step. This includes inventions related to new industrial products, newly developed industrial methods, or new applications of existing industrial techniques *(Article 1, Intellectual Property Rights Law No. 82 of 2002).*

The French legislator, on the other hand, has defined an invention in patent law as "any new and innovative solution to a technical problem that can be applied in the industrial or commercial field" *(Article 6 of Law No. 68-1252, amended by Law No. 2016-1691, dated December 9, 2016).*

Regarding the concept of invention, Jean-Baptiste de Bellisle, the French jurist, stated, An invention is defined as 'the creation of something new that did not exist before, or the improvement of something already existing, such that it yields an economic or social benefit, and possesses a certain degree of novelty and innovation.'" *(Bellisle, 1990, p. 98)*

In discussing the nature of inventions, Pierre Rivier, the French jurist, noted, "An invention is defined as 'the creation of something new that did not exist before, or the improvement of something already existing, such that it results in an economic or social benefit, and possesses a certain degree of novelty and innovation, and can be practically implemented.'" (*Rivier, 1992, p. 125)*

Most definitions describe the invention as a technical solution, and therefore, a technical solution is one of the distinguishing elements of the grant of a patent (Anderfelt, 2018, p. 45).

Nonetheless, what about the inventions arising from artificial intelligence, as referenced by WIPO through the terminology "AI-generated" or those autonomously generated by AI

These designations denote the existence of inventions generated by artificial intelligence, which can be categorized as follows:

1. Inventions autonomously generated by artificial intelligence, i.e., devoid of human intervention.
2. Inventions resulting from artificial intelligence with human involvement, where the nature of this involvement varies. For instance, a human may present a problem to artificial intelligence, which subsequently formulates solutions independently, or humans may input requisite data for analysis by artificial intelligence.

Hence, to identify inventions resulting from artificial intelligence, they can be characterized as "innovations comprising original and inventive concepts with practical applications, wherein novelty, innovation, and industrial applicability are achieved autonomously by artificial intelligence or with human aid in conjunction with artificial intelligence" *(Khaled, 2023, p. 271).)*

Numerous jurists have provided definitions for inventions derived through artificial intelligence. For instance, in Egyptian jurisprudence, Dr Ahmed Abdel Salam Awad views inventions derived by artificial intelligence as: 'Inventions resulting from artificial intelligence applications, which are manifested in the machines' ability to think and create, and make decisions without human intervention.' *(Awad, 2018, p. 255)*

In French jurisprudence, Dr André Pico believes that inventions derived through artificial intelligence are: 'Inventions resulting from artificial intelligence applications, which are manifested in the machines' ability to generate new

ideas and develop innovative solutions to problems.' *(Pico, 2019, p. 1082)*

In Saudi jurisprudence, Dr. Abdullah bin Mohammed Al-Khudairy views inventions derived through artificial intelligence as: 'Inventions resulting from artificial intelligence applications, which are manifested in the machines' ability to innovate and invent, without substantial human intervention.*' (Al-Khudairy, 2021, p. 47)*"

Based on the previous definitions, the question arises about how to protect these inventions developed by artificial intelligence. If we look at intellectual property rights, we will find that they have provided a kind of protection for inventions in general, known as patents, and they are considered one of the most important means to protect modern and technical inventions.

The patent system in the Kingdom of Saudi Arabia defines a patent as "the document granted to the inventor so that his invention enjoys the protection prescribed within the Kingdom of Saudi Arabia*" (Makhlouf, 2018, p. 29).*

French law also refers to a patent. Article L611-10 of the French Intellectual Property Code No. 92-597 of July 18, 1992, states, "Every new and useful creation capable of industrial application is eligible for a patent."

The World Intellectual Property Organization (WIPO) defines a patent as "an exclusive right granted to an inventor for a new invention in the form of a product or process that generally provides a new way of doing something or offers a new technical solution to a problem. To obtain a patent, the technical information relating to the invention must be disclosed to the public in the patent application.*"((Dabousi, 2021, p. 87)*

By reviewing the previous definitions, I think that the appropriate definition of a patent is that it is "a document issued by the competent authority that includes a statement of the invention and its descriptions and gives its inventor the right to exploit it in a specific period during which he enjoys legal protection*" (Najib, 2021, p. 320)*

3.2 .The Reasons Driving Us to Grant Patent Protection to Generative Artificial Intelligence Inventions

Based on the aforementioned considerations, an examination of the distinctive nature of inventions originating from artificial intelligence reveals the imperative need for their protection. Such safeguarding serves to bolster the advancement of artificial intelligence technology while fostering a conducive environment for innovation and the proliferation of groundbreaking inventions. By affording protection to these inventions, developers of artificial intelligence are incentivized to pursue further innovation, thereby fortifying the vitality of this burgeoning field. Moreover, safeguarding these inventions ensures the preservation of intellectual property rights and prevents unauthorized utilization by companies in the future. It also mitigates the risk of misattribution, wherein the true creators of these inventions may be overshadowed. Therefore, it becomes imperative to secure patent protection for inventions derived from artificial intelligence, thereby safeguarding humanity's access to the substantial benefits they offer. *(Dabousi, 2021, p. 89)*

the critical question arises as to whether AI-derived inventions fall within the purview of patent protection. Examining the definitions of patents, we observe that they confer legal safeguards upon an invention in favor of its

inventor, granting them a comprehensive set of legal privileges and rights over that invention. This protection is materialized through the issuance of a patent document from the relevant patent office. Examples of these rights encompass the inventor's exclusive legal authority to exploit their invention in any manner they deem fit, including manufacturing, selling, or utilizing it *(Abdulrahman, 2021, p. 1787).*

Despite the provisions of Article 27 of the TRIPS Agreement, which mandates that patents should be available for any invention, whether products or processes, across all technological domains, provided that they meet the criteria of novelty, inventive step, and industrial applicability. While AI-derived inventions do indeed satisfy these conditions for patent

3.2.1: The problem of granting AI a patent (paternity of invention resulting from AI)

The Patent is granted to the person who meets it after fulfilling its conditions. This person is called the inventor, and the inventor is" the person who contributed to the design of the invention and discovered its subject.*" (Al-Khudairy, 2021, p. 49).*

In another definition, "he is a person whose intellectual research work has effectively enabled the development of an invention of an artistic nature, and he is also the person who has already designed or developed the product or object that is the subject of the patent." *(Makhlouf, 2018, 33)*

The inventor is naturally a human being with superior mental abilities that he was able to exploit and develop to reach the thing that was invented eventually. This situation was in force before the stage of technological progress and the emergence of artificial intelligence and its applications, such as chatgpt and midjourney, and with the emergence of artificial intelligence and its applications, it became a tool to help humans discover many inventions that helped humanity, not only that, but it came to the point that artificial intelligence made inventions individually without human intervention, so is it suitable in this case for artificial intelligence to be an inventor? *(Dabousi, 2021, p. 98)*

The reality now imposes that patent ownership should be granted to the inventor. However, in the case of artificial intelligence, where the inventor is a machine or a system operated by artificial intelligence, the question arises: How can AI own a patent despite lacking legal capacity, or more precisely, lacking legal personality? Several questions surround this topic, leading us to suggest that there is a legislative void. Therefore, we propose granting legal personality to artificial intelligence and discussing the opinions on this matter.

3..2.2: Granting Legal Personality to Artificial Intelligence

Legal personality is defined as 'the capacity to acquire rights and bear obligations' *(Sultan, 2005, p. 209).* This concept is based on the fact that legal personality is primarily designated for natural persons, but it is also granted to other entities known as juridical or moral persons, such as companies. These juridical persons are a collection of funds or resources considered an independent legal entity *(Ahmed, 1988, p. 310).*

Beings or entities that do not possess the capacity to acquire rights or bear obligations are not considered to possess legal personality. Therefore, a legal person is defined as an entity capable of holding rights and bearing duties, and its actual existence is deemed necessary, whether the entity is human or juridical. This definition

includes individuals (natural persons) and legal entities like companies and institutions.

Let us examine what the Saudi Civil Transactions System stipulates about the natural and juridical person. It states the following in the chapter discussing persons: it sets legal articles for the person of natural status, stating, 'The personality of a human being begins with complete birth alive and ends with death' (*Article 3 of the Saudi Civil Transactions Law).* Then, in the second subsection about the juridical person, it sets examples, 'Juridical persons are the state, bodies, institutions... companies granted juridical personality according to system texts, everything granted juridical personality by regulatory texts' *(Article 17 of the Saudi Civil Transactions Law)*. Then, Article 18 discusses the rights imposed by the system for the juridical person, 'including the right to an independent financial liability, legal capacity, the right to litigation, independent domicile and nationality, and the right to have a legal representative' *(Article 18 of the Saudi Civil Transactions Law).*

In its second chapter, the Egyptian Civil Law also discusses the natural and juridical person, stating that the natural person 'begins with complete birth alive and ends with death' *(Article 29 of the Egyptian Civil Law)*. Regarding juridical persons, it states, 'Juridical persons are the state, directorates, cities... religious bodies... commercial and civil companies, ...' *(Article 52 of the Egyptian Civil Law)*. Article 53 of the same law stipulates that the juridical person enjoys all rights except those inherent to the natural human person within the limits prescribed by the law.

In French jurisprudence, Professor François Geny defines the natural person as 'every living human being of age, having civil capacity and the ability to contract.' *(Geny, 1999, p. 257)*. He also defines the juridical person as 'every group of persons or assets enjoying an independent personality from the persons forming it or the assets composing it.' *(Geny, 1999, p. 257)."*

One of the conclusions that can be drawn from the previous discussion is that legal personality is not limited to humans alone; it can also be granted to non-human or juridical entities such as companies and other moral entities. This expansion in the definition of legal personality is evident in some modern legislations, especially in the European legal system, which has recently begun granting certain aspects of legal personality to animals, providing them with rights that must be respected. It considers any violation of these rights a crime that warrants criminal and civil liability. *(Fatima, 2020, p. 218)*

Not only that but a certain degree of juridical personality has also been recognized for trees in some countries like Ecuador, where its 2008 Constitution stipulates certain rights for nature. Similarly, in Bolivia and India, legal characteristics have been granted to statues and idols, allowing them to sue through legal representatives. *(Hassan, 2023, p. 148)*

These developments in the concept of legal personality raise questions about the possibility of granting this status to artificial intelligence, especially in light of its growing importance and impact in various fields.

Based on the discussions, legislators may recognize legal personality for non-human entities when necessary in response to specific practical and social requirements. Given its increasing importance in our society today, this opens up the possibility of considering the grant of legal personality to artificial intelligence. However, the

issue of recognizing legal personality for artificial intelligence is a controversial subject, facing numerous challenges and differing opinions between supporters and opponents.

In the next part of the discussion, we will examine the opinions in favour of granting legal personality to artificial intelligence and the views opposing this idea. We will explore the arguments presented by both sides to provide a deeper understanding of this topic. Through this discussion, we will attempt to conclude whether artificial intelligence can be considered an inventor, a fundamental question related to how we interact with advanced technology.

3.2.2.1 Perspectives in Favor of Granting Legal Personality to Artificial Intelligence

Several trends have emerged supporting the recognition and granting of legal personality to artificial intelligence based on several justifications, the most important of which are:

1. **The analogy to Granting Legal Personality to Corporations**: This viewpoint is based on the concept that if corporations and juridical persons, entities that bear rights and duties, can be granted legal personality, then similarly, AI could also be endowed with this status. This school of thought believes that AI, like corporations, could have an 'independent financial estate' represented by the market value of robot programs, databases, usage revenue, and profits from their sale and exploitation. These financial assets justify granting AI a moral personality similar to that of corporations with independent financial estates. *(Al-Khatib, 2021, p. 223).*
2. **Recommendations of the European Parliament Dated February 16, 2017**: On this date, the European Parliament passed a resolution calling the European Commission in Brussels to present a proposal on civil law rules related to robots. This resolution aimed to create a unique legal framework for regulating the civil liability of independent, intelligent robot systems. The Parliament called for recognizing a unique legal personality for robots, wherein more advanced independent robots could be treated as responsible electronic persons, limited to those capable of making independent decisions and interacting autonomously. *(Al-Maadawy, 2021, p. 306)* The European Parliament justified this recognition due to the urgent need to overcome the shortcomings of traditional civil liability rules when dealing with the risks of new generations of independent robots, whose actions might be unpredictable or whose responsibility for damages could be hard to determine. This approach emphasizes the importance of adapting to technological developments and ensuring a legal framework that aligns with these advancements *(Maximin, N. (2017), p. 45).*
3. **The Unique Nature of Artificial Intelligence:** One of the main justifications for considering the grant of legal personality to AI lies in its unique characteristics and capabilities. AI systems are characterized by self-learning and evolution, sometimes making independent decisions and performing actions similar to humans, which enables

them to acquire rights and bear obligations. (Al-Qusi, 2018, p. 78) For instance, some countries, like Saudi Arabia, have moved towards granting citizenship to the robot Sophia, reflecting a change in perception towards these systems. AI technologies are now considered more than machines; multiple skills and superior capabilities distinguish them in interacting with their surroundings and making appropriate decisions for various situations. These characteristics suggest that AI systems have surpassed being mere machines or objects, supporting the idea of their eligibility for acquiring independent legal personality *(Hassan, 2023, p. 160).*

4. **Solving Legal Issues by Granting Legal Personality to Artificial Intelligence**: Granting legal personality to AI systems could help solve many complex legal issues. One of the most prominent issues is determining liability for errors arising from machines and AI systems. Identifying the responsible party for damages caused by these systems is complex, but by granting them legal personality, the systems themselves could bear responsibility. *(Ahmed, 2021, p. 253)"*

Furthermore, granting legal personality to artificial intelligence could solve the issue of rights related to inventions and creations produced by AI, such as patents. This recognition might contribute to clarifying how to deal with the intellectual property of works created by artificial intelligence, offering a legal framework that ensures the rights of all concerned parties. *(Khaled, 2023, p. 276)*

3.2.2.2 Opposing Views on Granting Legal Personality to Artificial Intelligence

Opposing voices to the idea of granting legal personality to artificial intelligence base their arguments on several justifications, some of which are outlined as follows:

1. **Avoiding Ethical and Legal Responsibility**: Opponents express concerns regarding identifying the responsible party in cases of errors or damages caused by AI. Granting AI independent legal personality might make it challenging to determine ultimate responsibility, potentially allowing manufacturers and users of these technologies to evade ethical and legal accountability for any resulting damages, directly affecting public order and social security *(Pierre-Saint, N.-M., & Maclure, J. (2018). P.1022*).
2. **Lack of Complete Autonomy in AI**: Granting legal personality to AI implies that these entities should possess will and consciousness, which needs to be attainable. AI technologies have not yet reached a level of self-programming without human intervention, nor have they developed to a stage where they can bear full responsibility for their actions. Recognizing AI's legal personality also requires granting it rights such as capacity, marriage, employment, financial liability, citizenship, etc. *(Hassan, 2023, p. 163).*

3. **Numerous Regulatory and Legislative Issues**: Establishing a legal framework for AI as a legal entity requires radical changes in current legal systems. It could be challenging to determine appropriate laws and regulations that ensure AI's safe and ethical use, leading to multiple legal complications, such as when AI robots should be given citizenship and whether AI can own property and bear debts, enter contracts, or be taxed on its properties *(Ahmed, 2021, p. 256)*.
4. **Lack of Justification for Granting Legal Personality to AI**: Some proponents of the opposing view argue that there is no legal justification for granting legal personality to AI. In intellectual property, AI cannot enjoy the rights emanating from it, as these rights require the necessary awareness to earn, protect, and be responsible for them, which are qualities only humans possess. Intellectual property rights are granted to those who can benefit from them, a condition not applicable to AI, as it is essentially a machine *(Al-Khatib, 2021, p. 235)*.
5. **Negative Impacts on the Job Market and Economy**: Granting legal personality to AI might lead to radical changes in the economy and job market. Some fear that this step could promote the replacement of human workers with machines, leading to increased unemployment and exacerbating social and economic inequalities *(Sovlez, 2016, p. 32)."*

3.2.2.3 The Researcher's Perspective on Granting Legal Personality to Artificial Intelligence

After presenting both the supporting and opposing views on granting legal personality to artificial intelligence, I strongly support the first perspective of granting legal personality to AI for several reasons:

1. The tremendous importance of AI technologies and their role in various aspects of life, and as they have become an unavoidable reality, it is necessary to recognize their legal personality to safeguard the rights of those interacting with and managing them.
2. Regarding the difficulties in applying legal personality, whether natural or juridical, to AI, it is possible to grant AI a legal personality that suits it. For example, it could be termed a 'virtual personality', representing a legal assumption necessitated by practical and real-world needs, and this personality would be by the actions and behaviours it performs.
3. Concerning the incomplete autonomy of AI, the significant development that these technologies undergo daily proves their ability to independently make decisions in many matters without human intervention, whether by the manufacturer, programmer, or operator. Their capacity for self-learning, communication, interaction with others, and making necessary decisions warrants granting them legal personality. This is aimed not only at protecting AI itself but also society from its illegitimate use and exploitation. The legal personality could be limited to specific AI systems capable of acting independently from the will and direction of the programmer, manufacturer, and operator.

4. This recognition necessitates significant changes in national laws to grant AI legal personality.

3.3. Legislative position on the question of whether AI is an inventor or not and whether it can be registered as an inventor in a patent

To shed light on this matter, we will provide a summary of the DABUS case that arose in 2018.

Dr. Stephen Thaler submitted two patent applications to the British Intellectual Property Rights Office for two inventions autonomously developed by artificial intelligence. While the inventor's name is typically a requisite for such applications, Dr. Thaler indicated "artificial intelligence" as the inventor's identity. Subsequently, he lodged the applications with the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO). Nevertheless, to his astonishment, both patent offices, along with the British Patents, rejected the applications *(Johanna, 2021, p. 401).*

Despite fulfilling all the criteria for patentability, the applications were declined due to the requirement that the inventor be a natural person. Presently, existing laws and regulations exclusively acknowledge natural persons with legal personality as inventors, excluding artificial intelligence entities. Consequently, patenting artificial intelligence systems appears unattainable. Even after Dr. Stephen Thaler's appeal to the British Supreme Court, the ruling was upheld, as the involvement of one or more natural persons is mandated for patent acquisition *(Khalaf, 2023, p. 6).*

If we look at the reasons for rejection:

Initially, as per the prerequisites delineated for acquiring a European or American patent, the inventor must be a natural person to assert their legal entitlements over their inventions. A careful analysis of this requirement reveals a crucial aspect: the necessity of a natural person as the inventor to procure a patent. However, in the case at hand, the invention originated from artificial intelligence. Substituting a human individual for the actual inventor, i.e., artificial intelligence, would amount to misleading the public *(Imogen & Lohr, 2020, p. 287).*

.We will find that the laws in force now, which require obtaining a patent that the inventor be a human person, have been applied to protect the rights of natural persons and ensure that they obtain the appropriate appreciation for that, and also to make sure that patents are kept in the hands of inventors and protect their rights from the exploitation of their inventions by companies. Accordingly, these laws were put in place, which require that the inventor be human and never look at the possibility of inventions in the future. By artificial intelligence

On the other hand, the TRIPS Agreement in Article 27/1 categorically clarified that all inventions are suitable for obtaining a patent and obligated all member states to this agreement to make this available in their national legislation as long as the conditions for granting a patent are met.

Moreover, Article 52/1 of the European Patent Convention stipulates that patents are granted to every invention in the technology field, provided that it is new, includes creative activity, and is industrially applicable.

"In the same agreement, Article 58 states: "Entitlement to file a European patent application. Any natural or legal person may file a European patent application, or any body equivalent to a legal person by the law governing it."

As mentioned earlier, we find nothing to prevent granting patents for artificial intelligence inventions.

Secondly, the reason for rejecting the registration of inventions derived through artificial intelligence is that the inventor here lacks legal personality. Therefore, these inventions cannot acquire the rights resulting from granting the Patent. This argument can be answered by the direction issued by the European Parliament in the report on the legal responsibility of robots with artificial intelligence. This trend is considered one of the trends that support giving robots with artificial intelligence legal personalities through which the legal personality of artificial intelligence can be given. Thus, artificial intelligence is considered an inventor with registered patents. *(Deshpande, and Kamath (2020)p 882*)

In summary, we can say that AI systems have evolved significantly and are now capable of creating inventions similar to those achieved by humans. These systems mimic human creativity and actively generate new innovations, indicating that they might become 'the main source of most inventions in the near future.' Given this rapid and impactful development in AI, I believe it is time to update and modify patent-related legal legislation to include innovations generated by these systems, ensuring a fair balance between the rights of human innovators and the increasing contributions of AI in this field *(Bensamoun et al., G. (2017), p. 583*).

Regarding intellectual property, the essential criterion should be AI's ability to learn and independently generate creativity, potentially producing works protected by intellectual property laws, such as inventions and artistic works *(Schuster et al. (2019), p. 194).*

The concept of invention should not be limited to the human element alone. However, it should be linked to the functional purpose, which is the possibility of obtaining a patent for any new creative idea, even if it originates from AI systems. Therefore, as AI develops to this advanced degree of autonomy, self-learning, and innovation without human intervention and acquires human-like qualities qualifying it for legal personality and the status of an inventor, legal texts related to intellectual property, especially patent laws, should be amended to include inventions produced by AI. This would foster the establishment of a legal framework that aligns with rapid technological developments and ensures intellectual property rights in the era of AI.

In affirming the global shift towards recognizing artificial intelligence as an inventor and entitling it to hold a patent in its name, the South African Patent Office recorded a historical achievement in July 2021. This office granted the world's first Patent, acknowledging artificial intelligence as the inventor. This step represents a significant shift in the global perspective of artificial intelligence, contrasting with the refusal in other jurisdictions such as the United Kingdom, Europe, and the United States to recognize AI as an inventor based on the principle that an inventor must be a natural person. Nevertheless, the South African Patent Office appears to adopt an encouraging stance towards employing artificial intelligence in producing socially valuable innovations, underscoring the importance of developing and utilizing this technology in the modern *era (https://2u.pw/li2Q2yY)*

4. Appropriateness of current legal rules for granting patents and AI developments

In the majority of legal frameworks, including that of Saudi Arabia, a specific set of

criteria must be met to obtain a patent for a new invention. These criteria typically entail the invention being novel, involving an inventive and creative step, and demonstrating industrial applicability. This discussion aims to delve into these criteria to elucidate the suitability of each standard and the extent of their applicability to inventions generated through artificial intelligence..

4.1 Innovation standard

Innovation is the act of discovering novel entities or concepts that did not previously exist. Within legal contexts, innovation encompasses both the identification of entirely new entities and the revelation of pre-existing entities that were previously unknown. It may manifest as an original idea or concept that constitutes advancement in industrial art, thereby enabling the attainment of outcomes previously unattainable within the existing industrial landscape. However, innovations that fall within the realm of ordinary industry development are deemed ineligible for patent protection, as they are considered commonplace improvements within the industry (Najib, 2021, p. 335).

It is not considered an innovation worthy of legal protection to discover a new scientific theory, but this theory must be applied in the field of industry so that its use is of direct economic value, and the innovation is not required to be the result of extraordinary efforts or particular research, but it is sufficient that the innovative idea represents progress in industrial art and exceeding the ordinary, and among the forms of innovation are new industrial products, a new industrial method, or the application of well-known industrial methods and means (Najib, 2021, p. 336)

Regarding innovation, the Saudi regulator stipulated in Article 44/B that an invention is considered to involve an inventive step if it is not apparent to a person skilled in the art to arrive at it from the prior art related to the patent application.

The first Article of Law 82 of 2002 on Egyptian intellectual property also confirmed the same contained in the TRIPS agreement, so it considered innovation every creative step that involves the creation of a new industrial method or product, the introduction of improvement to an existing method, or the reuse of a familiar method by employing new employment that did not exist before and is not known (*Mohamedain, 2004, p. 65).*

Therefore, this condition is considered one of the essential conditions, and it aims to grant only patents on innovative inventions of benefit at the industrial and economic levels.

If we apply the matter to inventions that have been developed by artificial intelligence, we find that it is necessary to have in these inventions an innovative activity that is not intuitive for a person working in the profession to which the invention belongs, and the issue of identifying the person in this case varies according to the type of invention itself and the extent of technology intervention in the matter, there are inventions that depend heavily on humans, and there are inventions that have been made entirely through artificial intelligence, so a standard must be set commensurate with the nature of the inventions that are adopted in a way Large on advanced technology and artificial intelligence applications, and therefore a committee must be formed in the patent office that includes technicians in general in the field of programming and data science that combines professional and technological

specialization because the invention is the result of one of the applications of artificial intelligence and it is possible to use one of the trained artificial intelligence applications specialized in this matter.

4.2. Novelty in the Invention

For a patent to be valid, the invention must be new, meaning not previously known; an invention does not deserve protection unless it is new (*Qalyoubi*, 2013, p. 109).

Novelty is meant, according to what is stipulated in Article 44A: " A. An invention shall be deemed new if not anticipated by prior art. In this respect, prior art means all that is disclosed to the public anywhere using written or oral disclosure, by method of use, or by any other means through which knowledge of the invention is realized. This has to be prior to the filing date of the patent application or the priority application. The disclosure of the invention to the public shall not count if it takes place during the priority period. The Regulations shall specify other cases of invention disclosure which do not fall within the meaning of prior art and the provisions governing the temporary protection of inventions. Egyptian Intellectual Property Law No. 82 of 2002 confirmed the same condition and also confirmed the French Property Law in its Article L.611-11

If the inventions do not meet the novelty condition, any interested party may oppose the issuance of the Patent.

Suppose we apply this criterion to inventions produced or developed by generative artificial intelligence invention. In that case, it must be new to be eligible for a previously known patent. Committees can be established to review whether an invention achieved through artificial intelligence is considered new or not.

4.3. Possibility of invention for industrial exploitation

The invention must be industrially exploitable; more is needed to grant a patent to discover a scientific theory without including an industrial application. There needs to be more than the discovery of the properties of steam to grant a patent. However, using steam as a motive energy for machines is a patented invention because it is a discovery capable of industrial exploitation. The meaning of industry in the field of patents is not limited to converting raw materials into manufactured materials; it includes agricultural and extractive industries. The invention of an agricultural machine can be granted a patent. As for the discovery of a new type of agricultural product, there was a difference of opinion about the permissibility of granting a patent for it, and it is likely that when these products are new and reaching, they involve an innovative idea *(Abdul Rahim, 1987, p. 94).*

This is stipulated by the Saudi regulator in Article 44/c of the Patent Law that "an invention is considered industrially applicable if it can be manufactured or used in any industrial or agricultural field, including handicrafts, fishing and services."

This was confirmed by both the French legislator in Article L. 611-15 of the Law on the Protection of Intellectual Property Rights and the Egyptian legislator in Article 1 of the Law on the Protection of Intellectual Property, and these legislations were in accordance with what was stated in the TRIPS Agreement, Article 27/1.

Suppose we apply this condition to inventions inferred by artificial intelligence. In that case, we will find that as long as these inventions can be helpful to humanity, such as the ChatGPT and Midjourney program, and provide solutions to humanity in terms of saving time and effort, they

are subject to industrial exploitation and meet the conditions of the Patent.

4.4. Legality of the invention

Article 4 of the Saudi Patent Law stipulates that a patent shall not be granted in the following cases:

If its commercial exploitation is contrary to Islamic law and also if its exploitation is harmful to life or to humans, animals or the environment. It is noticeable from the previous text that the Saudi regulator stipulated that in order for the invention to be protected by a patent, it should not be contrary to Islamic law, and this is also consistent with what was stated in the Basic Law of Governance, and on the other hand, the law stipulated that the invention should not be harmful to life or human health *(Al-Otaibi, 2015, p. 304).*

If we apply the matter to inventions derived from artificial intelligence, we will find that there is nothing to prevent that if an artificial intelligence invention is contrary to Islamic law and public order, it is prohibited and not protected by Patent because it is contrary to public order in the Kingdom of Saudi Arabia.

4.5. Disclosure of the invention (disclosure)

One of the most critical conditions confirmed by most of the legislation regulating patents is that the inventor discloses all the details related to his invention. The aim is to enable and help all workers in this field develop this invention and add to it. This is done by describing all the fine details of the invention from the description and drawings.

This is confirmed by Egyptian Intellectual Property Law No. 82 of 2002 in Article 13 thereof, which stipulates the following: "The patent application shall be accompanied by a detailed description of the invention that includes a full statement of its subject matter and the best method that helps the expert in its implementation ... "

The TRIPS Agreement also stipulates in Article 29/1 that the Member States must require the applicant to obtain patents the need to fully disclose the application and clarify the description of the invention in a way that enables the person with experience in the field of invention to implement the invention for which the Patent is requested.

Also, what is stipulated in the US Intellectual Property Act No. 35 in Article 112, The specification shall contain a written description of the invention and of the manner and process of making and using it in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his inventionThis is confirmed by the Saudi system in its executive regulations for the patent system, Article 14/4 on the need for the applicant to obtain a patent to provide an accurate description of the invention is the background of the invention, indicating the technical field covered by the invention and a description of the state of the previous technology, including any documents that the inventor is aware of, as well as the general description of the invention, indicating the advantages of the invention compared to the

previous technical situation and the goal of the invention, and this is clearly With the submission of all drawings that help in this, provided that the detailed description is clear and sufficient to enable the ordinary man of the profession to implement the invention.*(L. Bentley and B. Sherman, 2011, p. 66).*

Through the previous texts, we note that legislators intended a goal behind the disclosure of the invention, which is to update the science on which the invention is based, provide a full and appropriate explanation of the invention, and clarify the ideal way to use and operate it.

However, the critical question here is whether this condition applies to inventions that have been discovered through artificial intelligence techniques; if we apply the traditional legal rules mentioned above to discoveries that have been made by artificial intelligence, we will find the following:

Regarding the issue of disclosure to update the existing science in the field of invention, if the invention reached through artificial intelligence techniques is disclosed, it is considered an actual addition to the existing science and updating it, and if it is disclosed, its purpose is achieved, which is to update the existing science and work to increase the knowledge of scientists specialized in this field *(Khaled, 2023, p. 317).*

Regarding providing a complete and appropriate explanation of the invention, we find that there is a problem facing us in this issue, especially in the issue of disclosure and providing a full explanation of the inventions that have been discovered thanks to artificial intelligence techniques, as these inventions contain complex techniques even for inventors in this field, there is difficulty in the issue of revealing all the details of the invention, but this problem can be overcome by trying to share some of the necessary details by disclosing the algorithms for the invention, which help to Understand all the details of the invention.

Regarding the last goal of disclosure, which is also the method of using and operating the invention, we find that the inventor must disclose all the fine details that help specialists understand, operate and develop the invention. Still, for inventions that artificial intelligence techniques have discovered, the method of use is mathematical equations and algorithms, so it is revealing them sufficient to facilitate the use of the invention and remanufacture it again. We see from our side that if the equations and logarithms are sufficient in detail to help specialists understand The mechanism of the invention and its development, this is fine, provided that the description includes all the fine details of the invention *(Abdulrahman, 2021, 1794).*

5. Conclusion

Technological progress has had a profound impact on the life we live now, through which artificial intelligence appeared and developed until intelligence was able to make inventions entirely attributed to artificial intelligence in what is known as generative artificial intelligence, where recently applications appeared that were a significant breakthrough that changed all concepts, such as the pre-prepared chat model CHATGPT and also the generative artificial intelligence model MIDJOURNY Then the applications of generative artificial intelligence later followed and made a significant breakthrough and this boom resulted in a set of legal problems in the field of intellectual property rights, including patents and the extent of eligibility of inventions derived by generative artificial intelligence to obtain patents and the appropriateness of existing

legal legislation, including the Saudi regulator to protect these inventions with patents, so we talked about the research on what generative artificial intelligence is and about modern models that have made a giant leap in this field, then we explained the advantages and disadvantages Generative artificial intelligence and the risks arising from it Then we talked about the impact of patent provisions on artificial intelligence techniques by clarifying what inventions are derived by artificial intelligence, passing through the reasons driving them to grant patents and the legislative position on the issue of artificial intelligence being able to be registered as an inventor And finally we clarified the appropriateness of the existing legal rules for granting patents for inventions generated by artificial intelligence.

6. Results

1- Generative artificial intelligence technologies have made an unprecedented breakthrough in the field of artificial intelligence and life in general

2- Generative artificial intelligence has a remarkable ability to move, deep learning, respond to external stimuli, innovation, creativity, and invention of inventions that did not exist before and without human intervention

3- generative artificial intelligence (AI) applications, such as ChatGPT, Midjourney, and Bard, can make a significant contribution to patent law by enabling inventors to generate new ideas, test and improve them quickly and efficiently, and open up new avenues for innovation. With continued development and improvement of these technologies, they are expected to become even more efficient and accurate, leading to an increase in the number of new and innovative inventions.

4- There is a significant legislative vacuum in the issues governing the applications of artificial intelligence, especially in the issue of granting patents for inventions developed by artificial intelligence techniques.

5- According to the prevailing legislative frameworks in the field of patent law, it is a requirement that the inventor be a natural person, effectively excluding artificial intelligence as a qualified inventor. This presents a significant legal challenge in cases where artificial intelligence is the primary element in innovation, as these inventions are attributed to natural persons to avoid conflict with current laws. This practice highlights the need for legislative revision to include and reflect technological advancements and address gaps related to recognizing the legal personality of artificial intelligence and its role in creativity and intellectual property. Such a situation demands a thorough analysis of the legal and ethical dimensions of using artificial intelligence in innovation."

6- The legal debate on granting artificial intelligence (AI) legal personality is divided. Proponents compare AI to juridical entities like companies, referencing European Parliament recommendations for recognizing AI's legal personality and highlighting its self-learning and independent decision-making abilities. This recognition could resolve legal issues related to AI's liability and intellectual property rights. Opponents deem this recognition unnecessary, potentially leading to

manufacturers and operators evading responsibility. They cite AI's current human dependence and the complex legal challenges it could raise, including citizenship determination, contractual capabilities, property ownership, and tax obligations.

7. Recommendations

1- In consideration of the significant importance of artificial intelligence (AI) technologies and their vital role across various life aspects, and with an emphasis on protecting the rights of users and developers, it is advised to endow AI with an appropriate legal personality, potentially termed as a 'virtual personality.' This recommendation arises from practical necessities and aims to safeguard these technologies and the innovations attributed to them, in addition to preventing their illicit use

2- We recommend establishing a new legal framework to govern patents for inventions made by artificial intelligence (AI). This framework should include provisions for granting AI virtual legal personality, allowing it to obtain the right to a patent and, thus, be recognized as an inventor.

3- Special committees must examine artificial intelligence inventions, including people specialized in artificial intelligence. One of the artificial intelligence applications can assist in the committee's work while the committee maintains records of inventions made by artificial intelligence.

4- It is recommended that all countries, notably the Kingdom of Saudi Arabia, follow South Africa's lead in recognizing artificial intelligence as a qualified inventor eligible for patent rights. This approach reflects global advancements in intellectual property and supports technological innovation. South Africa's pioneering stance as the first nation to grant inventor rights to artificial intelligence highlights the necessity of updating legal systems to align with modern technological developments and to foster innovation in the era of artificial intelligence.

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