

A Brief Analysis of Intellectual Property Law under the Impact of Artificial Intelligence

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Abstract: As a significant catalyst for a new era of scientific and technological innovation and industrial transformation, artificial intelligence is profoundly altering the manner in which society produces goods and services and the course of human existence. The challenges associated with the creation, art, invention, algorithms and big data in the context of artificial intelligence can be categorized as follows: The object scope of artificial intelligence creation is ambiguous, and the system of subject identification is lacking. The moral rights system exhibits a lack of applicability in the domain of artificial intelligence creation. The process of obtaining rights and the identification of the duration of rights are not aligned with the actual needs of social development. In light of these challenges, the paper puts forward the following recommendations: Firstly, it should be acknowledged that artificial intelligence creations can be the object of intellectual property. Secondly, the designer and actual operator of the artificial intelligence creation should be entitled to the corresponding rights. Thirdly, in view of the non-human characteristics of artificial intelligence, the moral rights of authors in the context of artificial intelligence creation should be appropriately restricted. Given the efficiency of artificial intelligence creations and the rapidity of work renewal, it is necessary to establish a compulsory registration system for the copyright of artificial intelligence creations, and appropriately shorten the duration of rights.

Keywords: Artificial Intelligence; Intellectual Property Law; A Work of Creation; Copyright.

1. Introduction

The rapid advancements in science and technology have led to significant improvements in the automation and intelligence of artificial intelligence, resulting in its extensive application across various domains. This has precipitated a substantial growth in the field. While AI has emerged as a primary catalyst for a new industrial revolution, it has also precipitated profound changes in social production and life, existing legal frameworks, and social order. The accumulation of big data, the innovation of theoretical algorithms, and the enhancement of computing power have collectively led to significant advancements in the application of artificial intelligence across diverse domains. The categorisation of artificial intelligence can be delineated by the extent to which it can independently think, reason, and solve problems. This delineation can be further subdivided into weak artificial intelligence and strong human intelligence. The distinction between these two forms of artificial intelligence lies in their ability to think, reason, and solve problems independently. Strong artificial intelligence exhibits self-thinking awareness and can adapt to external environments, whereas weak artificial intelligence is constrained to specific data sets and lacks autonomous consciousness. The formulation of laws must align with the actual needs of social development. Currently, strong artificial intelligence remains in the exploratory phase, and the subject under discussion in this paper pertains to the development stage of weak artificial intelligence.

2. Ai Creations Challenge Intellectual Property Law

2.1. The Scope of the Object of Intellectual Property is to be Defined

The application of big data models to the development of artificial intelligence has resulted in the emergence of creations that exhibit individuality and innovation. These creations have been trained on vast amounts of data and have the potential to enhance production efficiency and the user experience in real-life contexts. Consequently, it can be posited that these creations may fall within the ambit of the Copyright Law of the People's Republic of China, or the Patent Law of the People's Republic of China.

2.1.1. The Originality of Artificial Intelligence Creation Remains to be Determined

The pivotal factor in determining whether an artificial intelligence creation can be considered a work is the acknowledgement of its originality. In the contemporary era, artificial intelligence creations manifest in an incessant stream, with numerous exceptional creations of a high calibre emerging, with some even surpassing the creations of human beings, provided that the source is concealed. However, if the source is revealed, it becomes challenging to ascertain whether the creation is of human or artificial intelligence origin. The prevailing paradigm within copyright law is that of human intelligence at its core, with certain scholars propounding the notion that only human intellectual endeavours can be designated as creations. These scholars further posit that the absence of thoughts, opinions or feelings characteristic of human beings, along with the concept of "originality", renders artificial intelligence creations non-copyrightable. To illustrate this point, consider the case of the

"monkey selfie" copyright registration, wherein the United States Copyright Office rejected the registration on the basis that only works created by humans are protected [3]. However, this position is not universally held. Indeed, some scholars argue that "originality" should be recognised only if the quality of the creation itself reaches the same level as that of human works [2]. The advent of artificial intelligence (AI), with its capacity to analyse vast quantities of data using complex algorithms, has the potential to generate a multitude of creations in a short period of time. This may result in an exponential increase in the number of copyright objects and the production of a substantial number of homogenised works. Consequently, it becomes imperative to establish criteria for identifying the originality of AI creations.

2.1.2. The Patentable Scope of Artificial Intelligence Creations is to be Determined

The Patent Law, as amended in 2020, provides a clear definition of invention-creation into three categories: invention, utility model and design. This provides significant legal protection for innovative achievements. Notably, the Patent Law excludes the granting of patents on speculative concepts, such as scientific discoveries and rules and methods of intellectual activity. This provision is intended to prevent the monopoly of basic scientific principles or generally applicable thinking strategies. The algorithm in question delineates the steps and methods to solve a given problem, yet it does not involve specific technical implementation means. This abstraction renders the algorithm classified as the rules and methods of intellectual activities, and consequently, it does not meet the technical and practical standards required by the Patent Law, thus precluding it from patentability.

The efficient operation of an artificial intelligence system is contingent upon a sophisticated and nuanced algorithmic framework, with innovation in algorithms representing the crux of its technological capabilities. These algorithms are instrumental in propelling machine learning and decision-making processes. In accordance with prevailing legal provisions, the protection afforded by the Patent Law is contingent upon the close integration of algorithm innovation with the specific application scenario, culminating in the transformation of the innovation into a tangible technical solution or product. In the event of infringement, an infringer who implements the same functional algorithm through different codes may avoid legal liability, thereby weakening the need for the protection of original algorithm results and hindering the enthusiasm of innovators, as well as the healthy development of artificial intelligence technology. Therefore, determining the scope of the Patent Law's object to effectively balance algorithm innovation and intellectual property protection has become an urgent legal and practical problem.

2.2. The Subject of Rights of Artificial Intelligence Creations Needs to be Clarified

The fundamental dichotomy of subject and object has historically served as the foundational principle of jurisprudence. Within this framework, the concept of rights and responsibilities is exclusively attributed to human subjects. Conversely, non-human entities are regarded as objects, which are subject to rights but do not possess the status of subjects. However, contemporary jurisprudence is witnessing a gradual dissolution of this dichotomy, with a notable school of thought proposing the conferment of legal

entitlements upon artificial intelligence entities devoid of life. This development offers a crucial lens to comprehend the ownership rights of artificial intelligence creations.

From a historical perspective, the legal subject has undergone two significant expansions. Firstly, it has expanded from encompassing only natural persons with status to encompassing all natural persons. Secondly, it has expanded from natural persons in the biological sense to natural persons and some non-natural persons [3]. Some scholars have posited that by expanding the scope of the subject of intellectual property rights, the current legal provisions that stipulate copyright ownership and invention to be limited to natural persons can be altered. This would allow for the inclusion of artificial intelligence in the definition of inventors, thereby clarifying the legal relationship and ownership rights of artificial intelligent creations. Conversely, scholars with opposing viewpoints posit that in the current era of weak artificial intelligence, the capacity for legal responsibility and fulfilment of legal obligations is not within the remit of artificial intelligence. They contend that the rights of artificial intelligence creations should remain with humans, though the issue of ownership remains unresolved. Some proponents of this viewpoint advocate for the recognition of the rights of both the inventor of artificial intelligence and the information provider on which artificial intelligence relies for its learning processes. Additionally, there are proponents who argue that the entity operating the artificial intelligence is the subject of rights [4-5]. The ownership of rights concerning artificial intelligence creations remains a complex and contentious issue that has not yet reached an academic consensus.

2.3. Artificial Intelligence is Difficult to Apply Spiritual Rights System

Intellectual property, as a form of intangible property right, embodies the personality of the subject in their intellectual achievements. Copyright, for instance, encompasses both the personal right and the property right of works, with the personal right of works comprising personal interests as its content and often termed the "spiritual right". This is primarily manifested as the right of signature, publication, modification and protection of the integrity of works, with permanence, exclusivity and inalienability. Drawing upon Hegel's philosophical theory of personality property, it is often posited that "works are the personification of the author" within the domain of creation. Literary art serves as an embodiment of the author's personality, and the safeguarding of this spirit is of paramount importance to stimulate creative enthusiasm. However, in the context of artificial intelligence, there has been a significant weakening of spiritual rights. Unauthorised signature, private publication, and tampering with works will not harm emotionless artificial intelligence. Consequently, the necessity of spiritual rights and their potential functions require re-evaluation and further discussion.

2.4. The Method and Period of Obtaining the Copyright of the Creation are to be Determined

Firstly, the process of obtaining copyright must be considered. Copyright is divided into three categories: registration, acquisition and automatic acquisition. The Copyright Law adopts the principle of automatic acquisition, meaning that the author automatically acquires the copyright

of the work after its completion. It is important to note that the owner of the copyright registration is a voluntary act rather than a mandatory provision, with the aim of avoiding copyright disputes. However, the rapid and prolific generation of creative works by artificial intelligence has given rise to persistent disputes regarding the validation of rights, underscoring the limitations of the prevailing voluntary registration system. Second, the duration of copyright protection. Currently, the prevailing discourse on the ownership of copyright in artificial intelligence supports the notion that human beings become the subjects of copyright, a position that is more readily accepted in theory. However, the absence of a life limit in artificial intelligence, if coupled with the doctrine of death and the concomitant grant of copyright to human beings, risks the adoption of an "enclosure movement" approach to intellectual property rights. The duration of the copyright of artificial intelligence creations is, therefore, an urgent problem that must be addressed.

3. The Rule Design of Intellectual Property Law to Deal with the Dilemma Caused by Artificial Intelligence

The rapid development of artificial intelligence technology has had a significant impact on the field of intellectual property law. Not only has it led to a re-evaluation of the definition of traditional intellectual property subjects, but it has also prompted a wide-ranging discussion on the legal status of artificial intelligence creations and related systems. In order to address these challenges, it is essential that intellectual property law finds effective countermeasures to balance the relationship between technological innovation and legal regulation. It is vital that the legal framework is adapted to keep pace with technological development, whilst also ensuring that the legitimate rights and interests of stakeholders are protected.

3.1. Artificial Intelligence Creations Can Become Intellectual Property Objects

3.1.1. Artificial Intelligence Creation Originality Identification

The concept of "originality" is intrinsically linked to creativity and innovation, and the traditional understanding of "originality" is closely associated with the human condition due to our unique capacity for independent learning and decision-making, which enables us to produce works that are both novel and unprecedented. The assessment of originality, therefore, focuses on the creation of works rather than the subject of rights. The advent of artificial intelligence has led to the development of systems capable of generating creative and novel works such as music, poetry, and images through data analysis and algorithms. Denying the "originality" of high-quality artificial intelligence creations merely because they do not conform to the traditional concept of authorship, as defined by natural or legal persons, would be a misinterpretation of the true essence of "originality". In the context of advancing societal development, the concept of originality has undergone a transformation, expanding from physical entities to non-physical objects and, in the future, extending to non-human creations [6]. In evaluating "originality", greater emphasis should be placed on the intrinsic quality of the creation itself rather than on the creation tool. If artificial intelligence creations reach a level

comparable to human work, they should be recognised as "original" to promote the prosperity and development of culture and art.

3.1.2. Expand the Patentable Scope of Artificial Intelligence Creations

In consideration of the pivotal role of algorithms in the development of artificial intelligence, and their profound impact on economic and social transformation, it is imperative for the legal framework to evolve in tandem. The legal apparatus should consider the adoption of more adaptable protection mechanisms and the expansion of the patent scope within the domain of artificial intelligence. According to the provisions of Chapter IV of Part I of the Proprietary Examination Guidelines, as amended and implemented on 20 January 2024, the scope of the technical subject matter may encompass the method, to be understood in the broadest sense. To elaborate, the algorithm in question can be defined as "a method to expand the storage capacity of mobile computing devices". Its capacity to address a particular technical problem aligns it with the principles of patent law, as it represents a technological solution. However, it is important to acknowledge that as science and technology continue to evolve, artificial intelligence is likely to manifest in novel forms and confront fresh challenges. Consequently, the existing legal provisions may no longer fully align with the demands of societal advancement. In light of these developments, it is imperative to progressively expand the patent protection of algorithms within the ambit of the Patent Law, encompassing the classification of algorithms and their integration with technical solutions. This approach will ensure that the patent framework remains aligned with the evolving needs of society while fostering innovation. It is, therefore, essential to continue refining and enhancing the Patent Examination Guide for patent applications pertaining to artificial intelligence, thereby providing clear guidance to applicants.

3.2. Clarify the Subject of Intellectual Property Protection for Artificial Intelligence Creations

3.2.1. Ai Agents Cannot become Legal Subjects

As a subject within the domain of civil legal relations, it is imperative that two conditions be met: firstly, the possession of the capacity for civil rights, which necessitates the recognition by the subject of civil law of the nature, significance and consequences of their own behaviour; and secondly, the capacity for civil conduct, which requires the exercise of rights and the assumption of obligations and civil liabilities. The current state of artificial intelligence has been demonstrated to have developed to the level of voice communication, work creation and case analysis, with some scholars believing that this gradual development has resulted in the emergence of self-awareness. However, the reason why artificial intelligence can demonstrate the so-called self-will and emotions is based on the algorithms and codes given by humans, which are less forward-looking than humans, and thoughts and emotions are also based on the coding input by producers. The behavioural capacity of artificial intelligence remains a subject of debate, and the implications of this capacity, including its obligations and consequences, are yet to be fully explored. Consequently, the question of whether artificial intelligence can be considered a legal subject under civil law remains unresolved.

In addition to the fact that artificial intelligence is not legally responsible, the creation process of artificial intelligence deviates from the "sweat principle", which is also the reason why it cannot become a legal subject. In the field of theory, there are mainly two: the labour value theory of natural rights and the invention incentive theory of utilitarianism [7]. Intellectual property rights are predicated on the "sweat principle", whose legislative purpose is to encourage invention and creation, the creation and dissemination of works conducive to cultural and scientific development, and promote social development. However, artificial intelligence does not utilise its own "body" and "hands" to work, and for artificial intelligence, even if it is given the copyright or patent subject identity, it is difficult to achieve the relevant incentive mechanism. Consequently, from both the standpoint of the principles that underpin intellectual property law and its legislative objective, artificial intelligence agents do not possess the necessary characteristics to be recognised as legal subjects.

3.2.2. The Virtual Legal Personality System Can Hardly Solve the Dilemma of Subject Qualification

In the event that artificial intelligence is unable to be the subject of copyright, some scholars propose the creation of a virtual legal personality analogous to a legal person for the purpose of owning the rights of artificial intelligence creations [8]. In 2015, the European Parliament initiated a discussion on the relevant civil law norms of artificial intelligence, emphasising the creation of an electronic personality, or at the very least, for those artificial intelligences exhibiting autonomy, thereby conferring specific rights and obligations. This approach was adopted with a view to preventing the abuse of artificial intelligence without boundaries.

The company's virtual legal personality is intended to protect shareholders' interests and establish clear rights and responsibilities. However, the establishment of a virtual legal personality in artificial intelligence appears to be incapable of achieving the expected legislative purpose. The establishment of the system should have actual social significance, and the law should adjust the social reality as the object, with social reality being the primary consideration and law the secondary [9]. In this regard, some scholars advocate for the establishment of an "agent" system for artificial intelligence creations, grounded in the concept of virtual legal personality. This approach prioritises the legal personality of artificial intelligence, thereby classifying artificial intelligence creations as the object of intellectual property protection. Concurrently, the "agent" system facilitates the identification of a tangible "agent" for the virtual legal personality of artificial intelligence, thereby enabling the enjoyment of legal rights and the fulfilment of legal obligations [10].

The significance of the existence of a virtual legal personality is to counteract the factors that hinder the identification of "originality". It is only by recognising that artificial intelligence creations also have the legal qualifications and rights of intellectual property rights that we can no longer create an additional virtual legal personality system. However, under the "agent" system, the ownership of rights and justice is the "principal". In the current era of weak artificial intelligence, where the balance between rights and obligations has yet to be realised, the "agent" system is unable to fulfil its intended role. As such, the ownership of rights pertaining to artificial intelligence creations should be based on human beings, thus rendering the concept of bestowing

virtual legal personalities upon artificial intelligence redundant.

3.2.3. The Rights of the Artificial Intelligence Creation Belong to the Designer and the Actual Operator

In the context of AI agent development, the AI designer is responsible for determining the system's overall architecture, algorithm design and function planning. The learning data provider's role encompasses the provision of training data and learning resources for the system. The operational experience and skills of the actual operator directly impact the creation of artificial intelligence. Consequently, the ownership of rights for artificial intelligence creations is primarily determined by the aforementioned three aspects.

In the event that the entitlement to artificial intelligence creation is assigned to the designer, the designer's ability to comprehend the algorithmic processes underlying artificial intelligence may be compromised. Consequently, the designer may encounter challenges in fully apprehending the creation of artificial intelligence. The designer's primary objective in developing artificial intelligence is typically focused on the acquisition of intellectual property rights, product sales, and associated benefits. Conversely, the designer's creativity is instrumental in defining the fundamental characteristics and capabilities of the artificial intelligence, thereby influencing the success of the creation.

In the event that the intellectual property rights of artificial intelligence creations are attributed to the learning data provider, it must be acknowledged that, while substantial data and algorithms are instrumental in the development of artificial intelligence, the volume of data utilised by artificial intelligence learning is so vast that it becomes almost impossible to statistically authorise all the contributors of data information. Consequently, attributing copyright to the provider of AI learning materials is tantamount to venturing into uncharted copyright territory.

In circumstances where the entitlement to the AI creation is attributed to the actual operator, certain scholars posit that the fundamental objective of copyright legislation is to promote innovation. The primary intent of operators in acquiring and utilising artificial intelligence is to generate new creations, and the formal recognition of their entitlement to copyright can potentially enhance their inclination towards creation. This system design bears resemblance to China's regulatory framework concerning the ownership of rights for works [11]. Conversely, certain scholars have advocated for the implementation of the penetration principle, which considers the designer and the actual operator of artificial intelligence to be *de facto* collaborators, thus entitling them to share the intellectual property rights of artificial intelligence creations.

In conclusion, the present study posits the hypothesis that the designer and the actual operator, as the right holders, can establish a productive connection with the prevailing legal system. This would assist in promoting innovation within the extant legal framework. The technical background is deemed to be both reasonable and practical.

3.3. Restrict the Moral Rights of Copyright in The Context of Artificial Intelligence

In the event of artificial intelligence assuming the role of the creator, it becomes evident that this entity is devoid of emotion. Moreover, the granting of spiritual rights to artificial intelligence, akin to copyright, further undermines the rationale for its existence. Even if the copyright of the

artificial intelligence creation belongs to the artificial intelligence designer and the actual operator, the latter will not suffer mental damage due to others' unauthorised use of the work and modification of the work. This is because the artificial intelligence designer and the actual operator can control the artificial intelligence energy, but cannot fully control the work created by artificial intelligence. Consequently, the act of self-tampering with a work will not be regarded as a violation of the personality of the designer or the actual operator. The purpose of the right to modify and the right to protect the integrity of the work has become a fixed form of artificial intelligence creation to a large extent. Therefore, it is necessary to restrict the spiritual rights of artificial intelligence. The copyright law's emphasis on the protection of artificial intelligence-created crops will also shift from personality rights to property rights [12].

3.4. Set the Method and Duration of Creation Copyright

Firstly, the large number of artificial intelligence creations necessitates the implementation of a voluntary registration system, which, when dealing with a substantial number of works, may compromise efficiency and lead to challenges in the confirmation of rights and the resolution of disputes. Consequently, it is imperative to consider appropriate modifications to ascertain the rights of artificial intelligence creations and the corresponding registration for reference. In this regard, the establishment of a compulsory registration system for the copyright registration of artificial intelligence creations is imperative. This system should mandate relevant subjects to register for reference in a timely manner following the creation of the work. This will ensure that all works have clear rights ownership and registration records, thereby reducing the risk of disputes over rights confirmation. Conversely, contemporary information technology, such as blockchain, holds considerable potential in facilitating expeditious registration and verification of works, thereby enhancing registration efficiency, streamlining the registration process, and curtailing superfluous expenditures.

Secondly, in comparison with the author's protracted creation and replication cycles, the artificial intelligence creation and replication cycle is expedited by the naked eye. The designer merely necessitates the preliminary configuration of the artificial intelligence algorithm, in conjunction with the particular implementation of the operator, to engender a perpetual stream of works. Furthermore, the imprint of a specific time, place and event is imprinted on the works created by artificial intelligence, resulting in the vitality of the work being correspondingly shortened. In traditional creation conditions, an author's income is typically dependent on the lifespan of the work, whereas the income of an artificial intelligence creation subject is largely contingent on the quantity of works produced. The demand for long-term protection of intellectual property rights is not significant. Adopting a protection period for intellectual achievements under the Copyright Law for artificial intelligence creations could potentially lead to a monopoly, due to excessive protection, and result in the compression of human creative space and the infringement of social public interests to a certain extent. Consequently, the Copyright Law should consider reducing the copyright protection period of artificial intelligence works according to the actual needs of social development. For instance, the British copyright law sets the protection period of the works

of natural persons to the life of the author and 70 years after death, and sets the protection period of artificial intelligence creations to 50 years after the completion of the creation.

4. Conclusion

The advent of artificial intelligence has precipitated a plethora of challenges for the domain of intellectual property law. These challenges encompass the identification of the scope of intellectual property objects and the subject of rights in the context of human intelligence, the preservation and abolition of the moral rights system, and the establishment of the way and term of copyright acquisition. In order to achieve a balance between the advancement of artificial intelligence technology and the requisite legal regulation, it is imperative to undertake a reasonable legal positioning and protection of artificial intelligence creations within the prevailing legal framework. The present paper contends that when artificial intelligence creations meet certain standards of creativity and originality, they should be recognised as "original" and thus become the object of intellectual property. While AI itself cannot be a legal subject, the rights to its creations can be vested in the designer and the actual operator, thus connecting with the existing legal system and helping to encourage innovation. In the context of artificial intelligence, the legitimacy of moral rights in the traditional copyright law is called into question and should be restricted. In the context of artificial intelligence, the legitimacy of moral rights in the traditional copyright law is being called into question, and it is suggested that the term of copyright protection be shortened to avoid the monopoly phenomenon caused by excessive protection. This can be achieved by the establishment of a compulsory registration system. In addition, with the wide application of artificial intelligence in fields as diverse as medicine and finance, it is important to ensure the legal and compliant use of artificial intelligence technology and to deal with new infringement problems. This is an important direction for future research.

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