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THE CONSTRUCTION OF FAIR USE OF COPYRIGHT AND COMPENSATION SYSTEM FOR ARTIFICIAL INTELLIGENCE CREATION

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Abstract

The AI-generated works must intersect with the right holder's work, thus having a certain impact on the rights and interests of the right holder's work. The law needs to explore and improve the regulation of the fair use of AI creations and build a compensation system to adapt to the development of AI. The development of AI technology has brought about problems such as the unclear relationship between fair use and infringement of copyright, the unclear general terms and conditions of application, and the incomplete criteria for judging at different stages. Through different theoretical methods, the legitimacy of the rational use of the system can be demonstrated. The compensation standard for fair use of copyright in AI creation can refer to the market pricing of the right holder's work, and the compensation can construct a formula for the amount of damages for AI copyright infringement. The compensation standard should be based on the main factors affecting the market value of the work, so as to provide a reference for the compensation system of the fair use works generated by AI.

Keywords: *Artificial Intelligence, Creative Acts, Fair Use of Copyright, Copyright Compensation System*

1. INTRODUCTION

With the background of foreign affairs and law and the ever-changing landscape of the global governance system, looking at the changes in AI technology, the biggest controversy about artificial intelligence is that it is not a civil subject in the traditional legal sense, so its creation cannot be defined under the existing legal framework. Specifically, AI creation is divided into different stages. The AI operation process is divided into the stages of inputting data, mining and analyzing data, and outputting data. In the process of AI training data, the right holder's right of reproduction and adaptation may be infringed, and it remains to be argued whether it is necessary to establish a fair use system for protection. Therefore, this paper analyzes the technical characteristics of artificial intelligence and its collision and friction with traditional Copyright Law from the perspective of the history and latest developments, summarizes the previous research in this field and constructs a fair use and compensation system in order to find a balanced solution between the development of new technologies and the contradiction of legal lag. By doing so, we can provide solid legal foundation for enterprises operating overseas and the development of foreign affairs and law.

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2. RESEARCH METHODS

Similarity Score: Use cosine similarity or BLEU score to quantify the textual similarity between AI-generated outputs and the original training text. A lower similarity score indicates a higher degree of transformation. The formula is:

$$SimScore = \cos(\theta) = (A \cdot B) / (||A|| \times ||B||)$$

where A and B are the word vector representations of the AI-generated output and the original training text, respectively. SimScore $\in$ [0, 1], with values closer to 0 indicating a higher degree of transformation.

Functional Difference Coefficient: Assesses the extent of functional difference between the AI-generated output and the original work. If the AI output serves a completely different function from the original (e.g., transforming a novel into code), the functional difference coefficient tends toward 1. If the functions are the same (e.g., generating alternative news reports with AI), the coefficient tends toward 0.

Transformation Layer Depth: For deep learning models, the number of neural network layers traversed from input to output can be tracked in relation to the degree of transformation. A greater number of layers and more complex nonlinear transformations correspond to a higher degree of technical transformation.

The formula for calculating the degree of technical transformation T(x) is:

$$T(x) = w_1 \times (1 - SimScore) + w_2 \times FuncDiff + w_3 \times LayerDepth$$

where w_1, w_2, w_3 are weighting coefficients that can be adjusted based on specific scenarios. $T(x) \in [0, 1]$, and values closer to 1 indicate a higher degree of technical transformation, making it more likely to constitute fair use.

This study attempts to employ econometric methods to construct a quantitative indicator for the "market substitution effect M(x)." Specifically, the Difference-in-Differences (DID) method is used to estimate the impact of AI technology on the market revenue of copyright holders.

The fundamental logic of the DID method is to compare the difference in market performance between the "treatment group" (content producers affected by AI technology) and the "control group" (content producers unaffected or less affected by AI technology) before and after the introduction of AI technology, thereby isolating the causal effect of AI technology.

The specific model is formulated as follows:

$$Y_{it} = \alpha + \beta_1(Treat_i \times Post_t) + \beta_2 Treat_i + \beta_3 Post_t + \gamma X_{it} + \varepsilon_{it}$$

Where Y_{it} denotes the market revenue of content producer i in period t (such as subscription income, advertising income, licensing income, etc.); $Treat_i$ is a dummy variable for the treatment group (whether affected by AI technology); $Post_t$ is a time dummy variable (after the introduction of AI technology); and X_{it} represents control variables (such as content type, market size, macroeconomic conditions, etc.).

The core coefficient β_1 is the DID estimator, representing the net effect of AI technology on the market revenue of copyright holders. If β_1 is significantly negative, it indicates that AI technology substitutes the market of copyright holders. If β_1 is not significant or positive, it suggests that the substitution effect is not evident, and there may even be a complementary effect.

Based on the DID estimator, the market substitution effect score M(x) can be constructed as follows:

$M(x) = DID\_effect \times ElasticityCoeff \times MarketShare\Delta$

Here, ElasticityCoeff is the substitution elasticity between AI products and copyrighted content for the audience, and MarketShareΔ is the rate of change in the market share of the copyright holder. $M(x) \in [0, 1]$, with values closer to 1 indicating a more severe market substitution effect and a lower likelihood of constituting fair use.

The Fair Use Score (FUS) integrates the degree of technical transformation T(x) and the market substitution effect M(x), and incorporates two adjustment factors—public interest P(x) and international coordination I(x)—to form a comprehensive quantitative assessment framework.

The theoretical foundation of FUS lies in balancing analysis: the degree of technical transformation supports fair use (higher T indicates greater justification), while the market substitution effect opposes fair use (higher M indicates less justification). The balance between the two determines whether fair use is established.

Public interest P(x) serves as a positive adjustment factor, reflecting the social innovation benefits brought by AI technology, including technological progress, job creation, knowledge dissemination, and enhanced national competitiveness. P(x) is evaluated by an expert committee, with a value range of [0, 1].

International coordination I(x) acts as a positive adjustment factor, reflecting the compatibility of the proposed rules with mainstream international standards. If the proposed rules significantly deviate from internationally accepted standards, it may affect international cooperation and cross-border data flows, resulting in a lower I(x). I(x) also ranges from [0, 1].

$FUS = \alpha \cdot T(x) + \beta \cdot [1 - M(x)] + \gamma \cdot P(x) + \delta \cdot I(x)$

Weight Setting Rationale: Technical transformation and market substitution are the two core factors, each accounting for 35% of the weight. Public interest serves as a consideration for social benefits, accounting for 20% of the weight. International coordination functions as an external constraint.

FUS Scoring and Decision Thresholds:

The FUS value ranges from [0, 1]. The following decision thresholds are recommended:

$FUS > 0.60$:Constitutes fair use; no authorization is required.

$0.45 \leq FUS \leq 0.60$: Borderline case; it is recommended to pay fees through a copyright compensation fund.

$FUS < 0.45$: Does not constitute fair use; authorization must be obtained.

Indicator Definitions:

T(x) — Technical Transformation Score: Measures the degree of transformation between the AI output and the original training materials. Based on the inverse of cosine similarity plus the functional difference coefficient.

M(x) — Market Substitution Score: Measures the substitution effect of AI-generated content on the copyright holder's potential market. Based on Difference-in-Differences (DID) estimation.

P(x) — Public Interest Score: Measures the social benefits of technological innovation, including spillover effects, job creation, and enhancement of national competitiveness.
I(x) — International Coordination Score: Measures the compatibility of the proposed rules with mainstream international standards (e.g., TRIPS/Berne Convention).

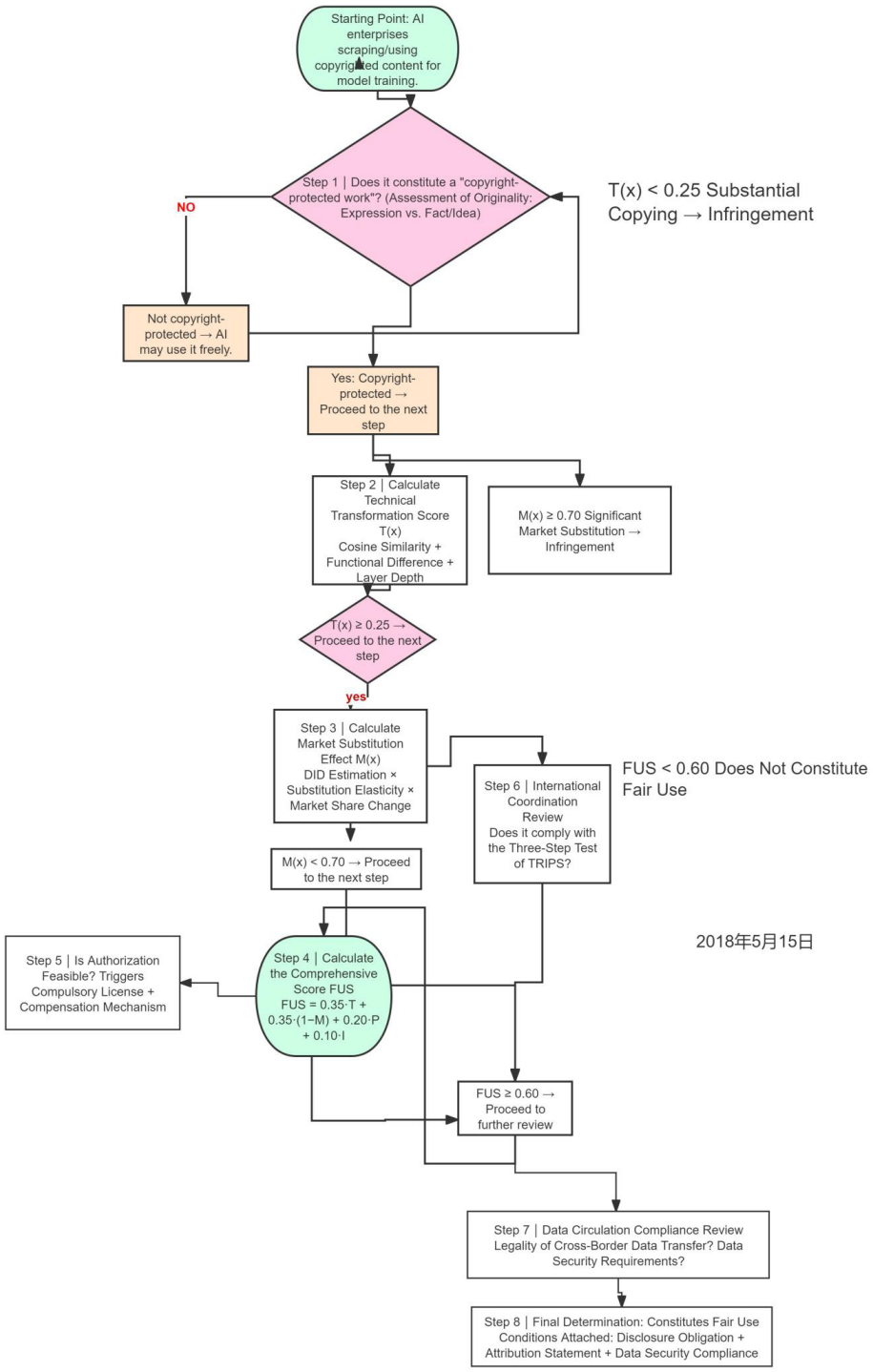

Figure 1. From Behavior Recognition to Final Determination: An Eight-Step Standardized Assessment Process

3. ANALYSIS AND DISCUSSION

3.1. The Fair Use Problems

The fair use problem brought about by the development of artificial intelligence technology: (1) The relationship between fair use and infringement is unclear; (2) The applicable terms are not clear; (3) The criteria for judging different stages are incomplete.

3.1.1. The relationship between fair use and infringement

In the use of artificial intelligence, copyright protection, as an important means to boost national economic development, needs to have a macro perspective. For artificial intelligence, the copyright protection of a single work does not have economic value. So in the use of artificial intelligence, copyright protection needs to have a macro perspective. Regarding artificial intelligence, some scholars believe that since information is "abstract", the economic mechanism based on physical objects as attributes does not apply to the information field. The AI-generated object is not only a single text, but also generates a textual image, a textual voice and video, and even a 3D work, which is beyond the scope of evaluation of the traditional Copyright Law framework. After the operation of data, the results produced by artificial intelligence are not completely controlled and predicted by humans, so it is a system with independence. Therefore, under the circumstance that the relationship between fair use and infringement is not clear, the operation of market value of a single work of artificial intelligence in accordance with the traditional model of Copyright Law will make the cost of its social use exceed and cause damage to public interest, thereby hindering the dissemination and utilization of scientific and cultural knowledge, resulting in a waste of social resources, which is not conducive to the improvement of social innovation capabilities and the progress of science and technology. It will provide a strong institutional guarantee for China in the international competition in science and technology, and this will enhance the ability of social innovation and the development of science, technology, and economy.[1]

[1] Ma Wei, “Research on the Fair Use System in Artificial Intelligence Creation” (master’s thesis, Shanghai Normal University, 2021).

3.1.2. The General Terms and Conditions Applicable

As Professor Wu Handong said, although the fair use system, as a historical product of the development of legal rights, was only based on the spontaneous reaction of interests and needs, and then the legislator took copyright as a legal right, although in the current Copyright Law, the principle of fair use has become the most controversial issue. The Copyright Law was established to achieve the goal of pragmatism, to effectively promote the dissemination of works and culture, to encourage innovation, and to promote economic development. Japan's Copyright Law has been amended more than 40 times, so the fair use system needs to be changed in line with the changes in artificial intelligence. With regard to fair use, the Copyright Law adopts a closed enumeration legislation, i.e., fair use is only constituted when the circumstances of use fall within the circumstances listed in Article 24.[2]

Licensing is a system allowed by the Copyright Law, but as mentioned above, due to the particularity of the operation of artificial intelligence technology, the demand for massive data feeding has made the traditional point-to-point low-traffic data model lose its operability, just like the reproduction right formulated for the printing era, which could initially become an effective means to control transactions and protect the interests of the original right holder. Despite its cultural importance, the information obtained from copyright owners was often complex, and many information rights holders and rights existed in fragmented form due to the lack of access to the necessary licenses.[3] The fair use system provides a solution to the contradiction of large-scale digitization through the rights review process that is too onerous for public institutions and private companies, and the jurisprudence is that the application of works is based on the premise of respecting the rights of the original creator by setting the statutory standards and scope of use of non-infringing works. If the work of the right holder is cited in the creation of artificial intelligence, it is reasonable and necessary to establish a system of inclined protection for the fair use of the copyright of artificial intelligence creation, because the creation of artificial intelligence is transformative and non-expressive, and at the same time conforms to the technical regulatory system, which is conducive to balancing the protection of private interests and promoting public cultural dissemination and technological economic development.[4]

3.1.3. The Judging Criteria for Different Stages

The essence of artificial intelligence creation is to obtain and use data, and data analysis belongs to the core link, in this process, artificial intelligence through

[2] Mei Shuwen, *Copyright Law: Principles, Norms and Examples* (Beijing: Intellectual Property Press, 2014), 15.
[3] Chu Meng, "The Challenges and Responses of Artificial Intelligence to the Copyright Infringement Liability System," *Northern Law Science*, no. 1 (2021): 138–50.
[4] Benjamin Sobel, "Artificial Intelligence's Fair Use Crisis," *Columbia Journal of Law & the Arts* 40, no. 2 (2017): 1.

data analysis methods, add new value to the initial value of data, realize the value of knowledge, so that the initial value of data is improved, which is essential for the expression of knowledge. For example, in the case of New Christian Church v. Penguin, when the defendant copied the text, it believed that the text was in the public domain, and the plaintiff sued for infringement.[5] Therefore, whether AI creation constitutes infringement and how to construct a fair use system needs to be studied.

To sum up, in view of the imperfection of the judgment criteria for different stages of AI creation, we will systematically sort out and demonstrate the necessity of constructing a copyright compensation system for AI creation in the following article.

3.2. General Terms and Theoretical Principles of Fair Use Judgment in Artificial Intelligence Creation

3.2.1. The Three-Step Test and the Fair Use of Artificial Intelligence

The three-step test established in Article 9.2 of the Berne Convention means that the application of the fair use system should be determined if the normal use of the work is not affected and there is no unreasonable damage to the legitimate interests of the right holder. Specifically, the application scenarios of AI are as follows: (1) "A specific situation" usually refers to the obstruction of freedom of speech and the public interest by the right holder for the sake of public policy objectives when using copyright to control specific behaviors. The era of artificial intelligence has arrived, and if the excessive protection of copyright will limit the development of artificial intelligence technology and public culture, it will even affect the national strategic level and meet the prerequisites for "specific" situations; (2) The key to determining whether a method of use can be used normally for the work is to interpret it according to market substitution, and this method of use does not conflict with the common forms of interest of the original work. The property rights of the copyright owner are limited to its original expression, and the use of the right holder's work by artificial intelligence will not have any impact on the normal use of the work. Because in the creation of artificial intelligence, data mining will convert a large amount of data into metadata, which is different from the original expression of the copyright owner. The dismantled metadata is already in a state of "all laws are one", and there is no original statement, so there is no infringement; (3) The complete use of the original work exists in artificial intelligence data mining, but this behavior does not bring publicity to the original work, and belongs to the use of the original work in a data group, which will not let the public have a cognition of the use of the original work, will not occupy the market of the original work, and will not affect the

[5] Penguin Books USA v. New Christian Church, 288 F. Supp. 2d 544 (S.D.N.Y 2003), https://law.justia.com/cases/federal/ district-courts/FSupp2/288/544/2509276/.

economic interests of the right holder. Therefore, the creation and use of works by AI will not cause unreasonable damage to the legitimate interests of copyright owners, and the construction of a fair use system for AI copyright meets the legal standards of the three-step test.

3.2.2. The Dichotomy of Thought-Expression and the Fair Use of Artificial Intelligence

The idea, conception, process, system, operation method, technical scheme and other aspects of the work. Expression is the specific ideas such as words, musical notes, numbers, lines, colors, shapes, and body movements. The element of "emotion" has always been in a high position in the Copyright Law, because it is an important criterion for judging the characteristics of a person. The subject in the sense of general civil law is a natural person, legal person or unincorporated organization, and the inclusion of legal persons into civil subjects has also gone through a long debate, so it is an inevitable trend for artificial intelligence to be included in the scope of civil subjects, just like some countries such as Dubai give artificial intelligence the status of citizens. In the Common Law system, the Copyright reproduction right is a kind of property right of the author. In the Civil Law system, author's right is an extension of the author's moral rights, and the work is the author's son and is part of the author's personality.[6] If the Common Law standard is followed, there is no need to consider whether the emotion is injected to produce the creation, but if the Civil Law standard is adopted, it is obviously necessary to be the embodiment of the author's will and emotion, and the injection of emotion is very necessary, otherwise it cannot be argued that the work and the author's spirit are one. However, according to the dichotomy principle of ideological expression, although feelings or thoughts are elements of a work, they are not protected under Copyright Law.[7]

3.2.3. Transformative use and fair use regime for AI

3.2.3.1. Content Conversion

In Blanch v. Koons, there is an increasing number of content-conversion applications in the analysis of whether appropriated artwork constitutes fair use. United States Federal Court of Appeals for the Second Circuit held that the defendant appropriated part of the plaintiff's work for himself, and when drawing the new creation, the defendant only appropriated a part of the plaintiff's work for itself and used it to evaluate the social and aesthetic influence of the mass media.[8] In Carious v. Prince, the defendant enlarged a photograph taken by the plaintiff and altered the people in several photographs, which was an artistic

[6] Thubias Wright, *Germany Copyright Law* (Beijing: China Renmin University Press, 2019), 11.
[7] M. J. Lei Bingde, *Copyright Law* (Beijing: Law Press, 2005), 11.
[8] *Blanch v. Koons*, 467 F.3d 244 (2d Cir. 2006), https://www.copyright.gov/fair-use/summaries/blanch-koons-2dcir2006.pdf.

transformation.[9] The Second Circuit Court of Appeals found that the 25 works significantly modified the color of the original, changing the original black-and-white shooting style to a color-blending style, and many other changes.

3.2.3.2. Purposeful Conversion

AI creation is purpose-transformative, while AI creation is consistent with the objectives of Copyright Law. The main purpose of purposive transformation is to make the content of the work more popular and different from the original creative purpose. The difference in the purpose of creation can be divided into the following types: (1) The adjustment of the proportion, size and clarity of the work by the original user, so that even if the public can fully obtain the work, it cannot meet the degree that the creator of the work hopes to make the public appreciate the work. (2) The user adjusts the content greatly, although the purpose of use also includes allowing the public to read and appreciate secondary creations, but this kind of conversion is usually a comical parody created by users with the main purpose of evaluating the original. (3) The full text of the original work is reproduced, but only fragments of the work or key materials related to the large-scale digitization project and the construction of the digital library are provided for public search, and the public cannot obtain the full text of the work. In the Perfect10 V. Google case, the court held that fair use can be constituted if there is a sufficient public interest purpose in the use process, especially if it has a conversion purpose or function.[10] At present, China has placed the development of artificial intelligence at the national strategic level, and the creation of artificial intelligence has not only completed the goal of testing the development of artificial intelligence technology and promoting the progress of artificial intelligence technology, but also completed the mission of creating valuable works with higher efficiency. In the case of Band-in-a-box, researchers can make further technical adjustments and optimizations according to the development level of existing technologies. For the purpose of AI creation to promote the level of high technology, promote the development of the cultural industry, the advancement of the AI industry and the progress of other emerging industries that apply AI, it is justified to apply a reasonable system. In the case of Perfect10 v. Google, although the commercial use of Google in this case may have an impact on the potential market of the work, the court held that if the commercial use can bring sufficient social benefits

[9] *Cariou v. Prince*, 714 F.3d 694 (2d Cir. 2013), https://www.copyright.gov/fair-use/summaries/cariou-prince-2dcir.2013.pdf.
[10] *Perfect 10, Inc. v. Google Inc.*, 416 F. Supp. 2d 828 (C.D. Cal. 2006), https://case-law.vlex.com/vid/416-f-supp-2d-602163402.

or has a public interest purpose, it can constitute fair use. On the one hand, in AI creation, since the pattern recognition technology and data mining technology used are the key methods of current creation, if the Copyright Law makes it impossible for AI to make full use of existing works, it will be difficult to popularize the promotion of new technologies and the improvement of creation. On the other hand, artificial intelligence can create many novels, music, paintings, etc., through machine learning, which are indistinguishable from human creations in a very short period of time, can create a new vitality, thereby giving society new culture value. For example, the HathiTrust digital library can also complete the replacement of books made by people with print disabilities to prevent them from being damaged or lost, and obtain e-books for the purpose of not being able to obtain books at a reasonable price. The Second Circuit Court of Appeals of United States found in 2014 and 2015 that the book was intended for the public to read because of the massive digital scanning associated with the original different uses.[11] This shows that although AI creation has certain commercial characteristics, the social and public benefits generated by it are much greater than the impact of the original author's market, and it is a purposeful transformation to which the fair use regulation can be applied.

3.2.3.3. Non-Expressive and Non-Commercial Use

In the first and third categories of transformational uses for other purposes, the expression of the original work is ambiguous, while the use of the original work and the transformation of the specific expression of the original work have nothing to do with it. In Kelly v. Arriba Software Inc. and Perfect10 v. Amazon.com, a United States court held that adjusting a photo to a search engine's thumbnail is a conversion rather than an artistic expression to make it easy for users to find.[12] In AuthorsGuild v. HathiTrust and AuthorsGuild v. Google, HathiTrust and Google converted existing books to electronic version on a large scale for easy public search, which is fair use conversion.[13]

Then, the United States scholar Seger did not call for a radical change to accommodate Non-expressive use, but only for the use of existing fair use regimes. Non-expressive use does not involve the specific expression of the text, but only focuses on the physical characteristics of the text. The non-expressiveness of AI creation is manifested in the following aspects: (1) In the context of copy-dependent

[11] Ma Zhongfa and Xiao Yulu, "Copyright Protection of Artificial Intelligence Creations," *Electronic Intellectual Property*, no. 6 (2019): 29–30.
[12] *Kelly v. Arriba Soft Corp.*, 336 F.3d 811 (9th Cir. 2003), https://www.copyright.gov/fair-use/summaries/kelly-arriba-9thcir2003.pdf.
[13] *Authors Guild v. HathiTrust*, 755 F.3d 87 (2d Cir. 2014), https://www.copyright.gov/fair-use/summaries/authorsguild-hathitrust-2dcir2014.pdf.

technology, the copy of the work created by AI is often accompanied by data transmission, which is an "objective technical phenomenon" in data transmission, and the two are almost synchronous. (2) The user only technically becomes an intermediary in the exchange of texts and information, and cannot browse, appreciate and disseminate it through conscious behavior. (3) It only constitutes an indispensable link in the complete technical process, and cannot form a copy of the work that is independently exploited and disseminated. Since Copyright Law aims to protect authors from the risk of substitution for expressive use, non expressive use does not convey the author's original expression to the public, so it does not constitute infringement. In the case of Sega v. Accolade, the court made it clear that the reproduction of an unauthorized copyrighted work is fair use and not an infringement. In the case that the original work is in a state of ambiguous expression, and the conversion and use of the original purpose is not related to the fair use it constitutes without involving the specific expression of the original work, the use of non-expression is still legitimate.[14]

With regard to the issue of commercial use, it can be seen from the above analysis that since the use of AI in the original right holder's work is transformative, it is irrelevant whether it is commercial or not.

3.2.4. Policy Choice and Market Failure Theory

3.2.4.1. Policy Choice Theory

Intellectual property rights are non-competitive and non-exclusive, and their main function is to stimulate innovation and promote economic and technological development. The digitization of cultural heritage, aimed at preserving and making it available online, is an important public policy objective for European countries.[15] The intellectual property law has the role of providing services and support for the development of science and technology, so it has been constantly revised according to the development of science and technology, and the time and variety of products for intellectual property protection have been continuously improved. The research goal of the fair use system of copyright for AI creation is to create a system that can stimulate innovation and achieve the goal of promoting scientific and technological progress and industrial development. The massive use of data by AI will undoubtedly lead to controversy under current Copyright Law, leading to increased litigation

[14] Sega Enters, Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992), https://www.copyright.gov/fair-use/summaries/segaenters-accolade-9thcir1992.pdf.

[15] Su Chang, *Research on the Infringement of Artificial Intelligence Creation* (master's thesis, Jilin University, 2020).

and business operating costs. The policy choice theory holds that the rationality of the copyright system is that it can adapt to the entire national policy and is the result of decision-making choice, and the degree of protection depends on the development of China's economy, trade and science and technology.[16] In particular, the emergence of new AI technology industries era requires the support of artificial intelligence technology, and the Copyright Law should not become a stumbling block to the economic development of the new technology and economy.

3.2.4.2. Market Failure Theory

Professor Gordon, the author of the market failure theory, asserts that while the four elements do implicit in directing the courts to determine the social need for use and the possible impact on the author's economic expectations, the ambiguity of the fair use doctrine and its statutory formulation obscures fundamental issues and makes consistency and predictability difficult to achieve. With these factors in mind, it is important to foresee some the underlying communication tensions, and thus more informative. Economic analysis of the copyright system helps to clarify these basic principles.[17]

Second, AI creation relies on a large number of works, requiring as comprehensive selection as possible as a text for learning. The more you excavate, the higher the time and cost of obtaining authorization. At the same time, the development of digital technology has also allowed rights holders to prohibit others from copying their works, and these technical means have exerted significant technical control and monopoly, which has led to an imbalance in competition in the intellectual property market and a reduction in the number of works that can be used in AI creation.[18] In addition, the right holder usually tries to adopt different licensing prices for the users who are connected with it, resulting in price discrimination.[19]

[16] Mei Shuwen and Song Ge, "On the Application of the Copyright Fair Use System to Artificial Intelligence Editing," *China Editor*, no. 4 (2019): 78–82.

[17] Wendy Gordon, “Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors,” *Columbia Law Review* (1982): 7.

[18] Mei Shuwen, "On the User Rights in the Copyright Protection of Technological Measures," *Intellectual Property,* no. 1 (2015): 16–20.

[19] Yao Hewei, "The Positioning and Application of Transaction Cost and Price Discrimination Theory in the Fair Use of Copyright," *Intellectual Property*, no. 3 (2012): 21–28.

3.2.5. Basic principles

3.2.5.1 Principles for the protection of the legitimate interests of copyright holders

In the context of the development of artificial intelligence, the way of dissemination of works has changed dramatically, and an excellent work will bring unprecedented spiritual wealth to the society. Strengthening the protection of the interests of copyright owners and recognizing the rights and interests that copyright owners should enjoy in works, performances, sound recordings, radio programs, etc., is the foundation for the existence and basic requirement of the Copyright Law. This helps to protect the creative enthusiasm of authors and the communication initiative of communicators, and increases the spiritual wealth of the whole society.[20] At the same time, some new interests have emerged in the development of artificial intelligence, which need to be appropriately adjusted according to the needs of the times. The adjustment of the law itself is also a manifestation of the legitimate interests of copyright owners.

3.2.5.2. Principles that motivate the creation and dissemination of works

The legislative purpose of the Copyright Law is to protect the copyrights of literary, artistic, and scientific works and encourage the creation and dissemination of works that are beneficial to building of socialist spiritual and material civilization, and promote the development and prosperity of socialist cultural and scientific undertakings.

3.2.5.3. Promote the realization of the principle of copyright benefit-sharing target

The basic ways to achieve benefit sharing in the Copyright Law are reasonable allocation of rights, appropriate rights restrictions, effective use of rights and balanced rights protection. The various disputes arising in the development of artificial intelligence, while considering individual interests, cannot be separated from the various disputes arising in the development of artificial intelligence, let alone the industrial needs and strategic requirements brought by artificial intelligence technology. In terms of the design of the legal system, it is necessary to combine the actual development of China's industry, and stimulate the vitality of the industry in accordance with the way of market selection and policy selection, and promote the high-quality and benign development of China's artificial intelligence industry.

[20] Wu Handong, *Intellectual Property Law* (Beijing: Peking University Press, 2005), 41.

3.3. Suggestions for Improving the Fair Use System for AI Creation

The development of digital technologies has led to the emergence of new business models and technologies that have strengthened the role of the Internet as a major market for the distribution and access to copyrighted content. The digital economy is a global megatrend, and robots such as self-driving cars and all other forms of artificial intelligence are being put into practice, which will inevitably rely on large amounts of data. Applications and devices will communicate with each other at the center of data. Therefore, in terms of the interaction between artificial intelligence science and technology policy and intellectual property legislation, all countries attach great importance to the development of artificial intelligence technology and industry at the level of national policy, and should promote artificial intelligence intellectual property legislation through science and technology policy, in order to provide good intellectual property legal protection for China's artificial intelligence technology and industrial development needs.[21]

Second, the fair use system was originally established to enable the general public to use original works at a reasonable cost, thereby stimulating innovation and promoting cultural prosperity, and becoming a distribution mechanism to subsidize public interests.[22] If a fair use system is not established, it will lead to the monopoly of business giants in the era of big data, which will lead to monopoly enterprises using artificial intelligence algorithms to guide the flow of information, and with the help of huge social networks and even reaching the tendency to influence voters in the United States election, in which case the justice pursued by the law no longer exists. We look forward to the establishment of a mechanism that will not only guarantee the creative enthusiasm of authors, but also promote the development of AI technologies, as well as the development and dissemination of culture. At the same time, it does not hinder the public's "access" to the work. It is essential to ensure that AI acquires works on a low-cost or no-frills program to facilitate the development of its technology.[23]

3.3.1. The Development of Artificial Intelligence and the Improvement of the Copyright System

As mentioned above, according to the copyright issues brought about by the development of artificial intelligence, some new contents of the current Copyright Law also need to be concretized by improving administrative regulations and updating judicial interpretations.

[21] Liu Qiang, *Research on Legal Issues of Intellectual Property Rights in Artificial Intelligence* (Beijing: Law Press, 2020), 100.

[22] Ma Zhongfa and Xiao Yulu, "The Infringement Dilemma and Way Out of Artificial Intelligence Learning and Creation," *Wuling Academic Journal,* no. 5 (2019): 66–76.

[23] Wu Handong, "Institutional Arrangements and Legal Regulation in the Era of Artificial Intelligence," *Legal Science (Journal of Northwest University of Political Science and Law)*, no. 12 (2017): 128–136.

3.3.2. The Legislation on the Fair Use System in the Context of Artificial Intelligence

Some scholars have proposed that the copyright system is centered on natural persons, and if the interests of the "human audience" are taken as the measure of fair use, then the AI training data input is a new way of fair use. Because the copying behavior of machine learning occurs at the machine level, just like crawler technology crawls web content, it does not directly provide works to human readers. Including AI learning in the scope of fair use does not compress the market for works, nor infringes on the legitimate rights and interests of rights holders, and is even beneficial to the progress of AI learning technology.[24]

3.3.3. Judicial Countermeasures for the Transformative Use of Copyright in Artificial Intelligence Creations

First of all, in the Google Library case and related artificial intelligence cases, the court applied the term "transformative use" more completely and explained it. As the country that formulated France, in the absence of explicit provisions, the courts directly broke through the legislative restrictions, and there was a certain degree of "judge-made" behavior. It is necessary to further explore the theoretical connotation of the regulation of "transformative use" applicable to the copyright of AI creation. To improve China's system for the fair use of AI creation copyrights, and to better guide relevant judicial practice, only by dialectically understanding and comprehensively grasping the transformative use of AI can we make appropriate determinations and references in law. For the transformative use rule, it is necessary to propose a set of practical standards for the court to refer to when adjudicating cases, so as to unify the judicial standards.[25]

Second, whether AI creation constitutes transformation and what perspective should be evaluated, roughly the following points are as follows: (1) It should be judged from the perspective of experts, especially artworks. A work of art has technical barriers that are difficult for non-professionals to understand, and the slightest change will transform it and show a wide variety of connotations, and if it is judged from other dimensions, it will cause an increasing probability of misinterpretation; (2) Judging from the user's point of view. An important criterion for evaluating the nature of transformation is the transformation of purpose, but only the author himself is aware of the subjective factors in the transformation. For example, in the Educational Testing Serv case, the judge used the "user's point of view" to determine whether the secondary creation was purposefully transformed; (3) Judge with a general, rational public eye.[26] The author's purpose of creation is for the satisfaction of spirit or wealth, and the participation of the ordinary and

[24] Yang Xudong, "Exploration of Fair Use in Artificial Intelligence Editing," *Science and Technology and Law*, no. 1 (2020): 8–14.

[25] Yang Zhenbo, “Judicial Application of the Rules for the Transformative Use of Works” (master’s thesis, Zhejiang Gongshang University, 2022).

[26] *Educational Testing Service v. Katzman*, 793 F.2d 533 (3d Cir. 1986), https://www.copyright.gov/fair-use/summaries/eductesting-katzman-3dcir1986.pdf.

rational end public is required to create demand. In judicial practice, cases involve subsidies in the field, and it is difficult to clearly determine the conversion criteria, so judges should freely determine the appropriate evaluation criteria based on the actual situation. At the same time, comprehensive application is achieved through three ways, namely purposeful transformation, content transformation and functional transformation. If there is a threshold for conversion, only when the conversion purpose is consistent with the relevant standards can it be determined to meet the requirements; In the era of business economy, it is necessary to focus on the market influence, and take the first and fourth elements as the first considerations to ensure the balance between fairness and efficiency. It does not matter whether it is a commercial use, it is only necessary to consider whether it promotes the public interest.[27]

3.3.4. Establishment of a Copyright Compensation System for Artificial Intelligence Creation

From the perspective of the original intention of the system, compensation is not the royalty of the right of reproduction, but the reasonable basis for fair use, and appropriate compensation for copyright beyond the reasonable limit. The reproduction ability of artificial intelligence is too strong, resulting in unreasonable damage to the interests of copyright owners and destroying the original balance of interests. The compensation system can re-establish the balance so that AI and copyright owners can resolve conflicting interests. However, because reasonable compensation is not a strict copyright reproduction fee or infringement compensation, but only a compromise solution to resolve the conflict between the two, it is difficult to strictly achieve absolute fairness of rights and obligations.

The mining and utilization of massive amounts of data in the process of AI creation should be included in the fair use system, supplemented by the Anti-unfair Competition Law for thorough protection, plus the various management methods mentioned above, and the targeted handling of individual cases, so as to create a good environment for the development of the emerging technology market. As Professor Mei Shuwen said, compensation standards are adopted for the special deep-level linking behavior of news aggregation media. In other words, when the chain creator substantially replaces the linked website, and it operates this special artificial intelligence, it will compensate for this use in advance. This is not only a restriction on copyright, but also a protection for the interests of AI platforms, as well as the interests of rights holders.[28]

[27] Mei Shuwen, "Legislative Improvement of the Fair Use of the Right of Information Network Communication," *Law Science,* no. 6 (2008): 103–112.

[28] Mei Shuwen, *Research on the Response and Reform of the Copyright System in the Integrated Development of Emerging Media* (Beijing: Intellectual Property Press, 2021), 12.

3.4. Compensation Standards For Fair Use Of Copyrights Created By Artificial Intelligence

Although there is no compensation for fair use of copyright in domestic legislation, based on the above analysis, considering the losses of the right holder, it is hoped that a foreign fair use and compensation system can be introduced to create a proviso under the current Chinese legislative system. On the one hand, we can refer to the calculation standards of domestic infringement damages, and on the other hand, introduce relevant foreign legal standards to achieve the best legislative effect under comprehensive consideration.

As for the calculation of the amount of damages for copyright infringement of artificial intelligence creations, it is necessary to return to the measurement of actual losses, and let the amount of damages for copyright damages reflect the market value of works and other information in the context of strong intellectual property protection. If damages do not reflect market value, they will undermine the enthusiasm for innovation and creativity, thereby distorting market competition and impairing the efficiency of resource allocation. Damages must reflect the actual market value of the work, and at the same time, the punitive damages mechanism should be used to punish the intentional infringement and correct the deviation in the calculation of the market value, so as to better protect the copyright and promote the use and market transaction of the work, which can provide ideas for us to construct a reasonable utilization compensation system.[29] "Market pricing plus punitive damages" means that the right holder takes punitive damages as the calculation standard according to the value of the work in the market and the application of the right holder, supplemented by intentional infringement. Under this model, with the help of the punitive damages mechanism, when there is a deviation in the calculation of market value, the actual loss of the right holder is reflected through the market value of the work, so that the infringer can pay a greater price, so as to obtain more compensation for malicious infringement and repeated infringement. The determination of price is affected by the supply and demand of the market, not only related to value, the market is the most efficient way to allocate resources. It is only through the market pricing system that the true value of the commodity can be reflected. When judicially determining compensation, the market value of the work involved in the case shall be recognized and studied, and the market price shall be reflected as accurately as possible.[30]

3.4.1. Factors Influencing Market Pricing

3.4.1.1. The Market Value of the Work itself

The most important factor in the market value of a work is the quality of the work itself, and the value of the article is reflected in the content. A high-quality article reflects both the author's painstaking work and the

[29] Kong Xiangjun, "The Overall, Market and Development Concept in the Judicial Protection of Intellectual Property," *People's Justice*, no. 1 (2014): 4–11.

[30] Jiang Huasheng, "The Market Value of Intellectual Property Damages and the Legal Structure of Judicial Adjudication Rules," *Intellectual Property,* no. 7 (2017): 60–67.

author's skill. A high-quality work can bring huge economic benefits to the right holder, and its dissemination will be wider and faster, thus forming a positive and virtuous circle of works.

3.4.1.2. Market Influencing Factors

First, when powerful and influential copyright owners are infringed, the loss of users will be more serious, and the sponsorship of advertisers will be reduced faster, which is of course a potentially greater loss of benefits for rights holders. Second, another important factor that determines the market influence of a work is the brand influence and communication power of AI works. For AI-created works, the greater their brand influence and dissemination, the more advertisers will be able to invest, obtain higher economic returns, and the greater the losses to rights holders after committing infringements. Therefore, the construction of a fair use compensation system for AI creations should take these factors into account.

3.4.1.3. Market examining factors

The actual consumption of the work being read, collected, and forwarded, as well as the length of time the work has been in the market, and the length of time it has been continuously followed by consumers, are the main points of market inspection factors. The browsing, collection, and forwarding of an article can be well documented with the help of technological advances. Which works are more popular and more in line with the actual needs of consumers are directly reflected by these indicators of reading. A widely reposted article can create a relatively high market capitalization, and an article that no one cares about after publication is naturally less valuable. Artificial intelligence recommends works with high views, long reading time, and wider dissemination to computer algorithms, so that the market value of works is further enhanced. The extent to which a work is disseminated reflects its market value, so these reading indices should be included in cases of copyright infringement created by AI. One of the factors that affect the market value of a work is the point in time and duration of the infringement. News works, film works, software works, etc., are time-sensitive, and once the work is published, it is infringed, which brings greater actual losses to the right holder. In its judgment, the court pointed out that news works generally receive attention for a short period of time because of the economic value they bring and the length of time spent after publication. Therefore, various market test factors should be considered in combination with different types of works, so as to construct a

corresponding proportion of remuneration system, so as to measure the market value of works.[31]

3.4.2. Calculation of the market pricing of the reasonable use compensation for copyright infringement in works created by artificial intelligence

The standard of "Market Pricing plus Punitive Damages" with "Market Pricing" as the core. The starting point of market pricing is to conduct a comprehensive calculation of the market value of the work involved in the case based on the market transaction price of similar works in a similar transaction environment, that is, the market method measurement of the work value. There are three preconditions for calculating the market value of a work using the market method. First, the environment in which the work is bought and sold should be largely similar. Second, the types of works involved should also be largely similar. Third, there should be transaction records of similar works. It can be considered that there is a similar market environment, because in the network without regional and temporal differences, the works created by artificial intelligence are disseminated through the network. The works created by artificial intelligence exist in digital form, and works of various types have similarities, and similar works are also easy to find. As for the third prerequisite, although the transaction records of similar works are relatively rare data, the approximate range of the transaction fees for the licensing of similar works can be obtained by means of big data analysis of the licensing fees, the compensation amounts for cases settled through reconciliation, or the compensation amounts for cases settled by assessing the damage judgments in similar cases, which is the approximate range of the transaction fees for the licensing of similar works. Therefore, according to the application requirements of the market method and the main influencing factors of the market value of the work, a calculation model for the amount of damages for copyright infringement by artificial intelligence can be constructed with the authorization fee as the benchmark and factors such as the transaction subject and the quality of the work as adjustment coefficients. Under the market pricing mode.

$$S = \sum_{i=1}^{n} pi \times zl \times sj \times YD$$

$$pi = V_i \times \alpha \times \beta$$

S represents the actual losses of the right holder.
Pi represents the transaction price of the comparable cases.
n represents the number of comparable cases.
ZL represents the market value coefficient of the work itself.
SJ represents the market inspection coefficient.
YD represents the market influence coefficient.

[31] Civil Judgment of the People's Court of Haidian District, Beijing Municipality, No. 22602 [First Instance] Min Chu of (2017) Jing 0108.

βrepresents the adjustment coefficient of the infringer.

It should be noted that it is necessary to establish a huge database, analyze by selecting similar and comparable cases, and use the market pricing model to calculate the accuracy of the actual losses with the help of appropriate benchmark values. Taking the works created by artificial intelligence as an example, when selecting similar cases, efforts should be made to minimize the deviation during the calculation, based on the similar popularity of the right holders and the similarity of the types of works involved in the cases. In terms of case selection, for the cases that can be compared in price, adopt a 100-point case evaluation system, score both parties involved in the case, obtain the value, and calculate theβvalue. Use a 5-point system to score the adjustment coefficients such as the quality of the work involved in the case, the duration of the infringement, and the number of views. The scoring criteria need to be adjusted and quantified by industry experts and judges according to the work records and similar completed transaction cases. Finally,to calculate the actual loss situation of the right holder is possible, which is convenient for the rational use of the compensation fees generated by AI and provides a reference basis.

3.5. Improvement of Copyright System and Strategic Countermeasures for the Development of Artificial Intelligence

3.5.1. Improvement of the Copyright Law and its Judicial Interpretations

The update of relevant judicial interpretations and the revision of the Copyright Law are called for. On the basis of summarizing existing cases and improving existing judicial interpretations, the judicial organs, in combination with the latest judicial practices, should deeply understand and study the latest standards of the Copyright Law, and formulate new judicial interpretations of copyright. Specifically, the following provisions should be added to the legal articles: (1) Clearly interpret the basic meanings of some copyright clauses, such as the basic scope of artificial intelligence-generated content and fair use. (2) Further explain the definition of works and the catch-all clauses, establish a relatively unified judgment standard, and provide guidance on aspects such as "originality", "expression in a certain form", and "other intellectual achievements" for the judgment of cases involving artificial intelligence generation.

3.5.2. Revision and Improvement of Regulations Supplementary to the Copyright Law

3.5.2.1. Revision and Improvement of the implementing Regulations of the Copyright Law

The Implementing Regulations of the Copyright Law is an administrative regulation that supplements and refines the systems that

are not easily applicable as stipulated in the Copyright Law, and it is also an administrative regulation that defines the basic scopes stipulated in the Copyright Law. Based on the research in the previous text, while the relevant provisions of the Implementing Regulations of the Copyright Law add several clauses and construct corresponding supporting mechanisms to facilitate the operation of the Copyright Law for the development of artificial intelligence, they should be adjusted in combination with the content of the Copyright Law. The following legal provisions are added: The use of the original work by artificial-intelligence-related media through quotation falls within the scope of fair use, but compensation should be provided. In the case of a work created in the course of employment, the unit of the right holder should, after deducting a portion of management fees from the remuneration obtained as agreed, transfer the remaining amount to the copyright holder.

3.5.2.2. Revision and Improvement of the Regulations on the Collective Management of Copyright

The Regulations on the Collective Management of Copyright is an administrative regulation that specifically stipulates the establishment conditions and activity rules of copyright collective management organizations. The system of reasonable use compensation for copyright in the application of artificial intelligence cannot be separated from the improvement and innovation of the collective management system. In the process of artificial intelligence using musical works and news works, it is necessary to establish more complete collective management rules, which can be regarded as part of copyright collective management. Specific improvement suggestions include adding an item under Article 29 to establish the competitive rules of collective management organizations. Explore collective management institutions that are not based on rights as the standard, but use copyright objects and artificial intelligence as the medium. Lift the restriction that the business between collective management organizations shall not overlap, introduce competition among multiple copyright collective management organizations, form a more reasonable intensive collective management model, and inject new vitality into copyright collective management activities.

3.5.2.3. Revision and Improvement of the Regulations on the Protection of the Right of Communication through Information Networks

The Regulations on the Protection of the Right of Communication through Information Networks is an administrative regulation specifically legislated for the special rules of the right of communication through information networks. Given that the basic characteristic of artificial intelligence is three-dimensional geometric divergent

dissemination, the issues of the copyright system in the development of artificial intelligence are mainly manifested as issues of the right of communication through information networks system. In other words, the Regulations on the Protection of the Right of Communication through Information Networks is the basic legal foundation for regulating copyright issues in the process of artificial intelligence development. Specific amendment suggestions include adding to the Regulations on the Protection of the Right of Communication through Information Networks under Article 12. It should be combined with the latest development trends to provide institutional guarantees for the development of AI. First, in the form of several special provisions, for the special circumstances of the fair use of the right of communication through information networks, rules are stipulated that non-competitive use by artificial-intelligence-based social media constitutes fair use, and rules for the fair use of the right of communication through information networks by the visually impaired group. Second, establish non-profit rules for the rational use of the right of communication through information networks of artificial intelligence. Third, adopt in-depth linking with the substantial presentation standard and stipulate a "compensation" system such as for artificial intelligence.

3.5.3. Supporting Countermeasures for the Fair Use System of Copyright in Works Created by Artificial Intelligence

First, it is necessary to enhance the enthusiasm for creating outstanding copyrighted works with the aid of artificial intelligence. Artificial intelligence should not be a synonym for infringing use but rather a new force in literary and artistic creation. The state can take measures such as allowing artificial-intelligence-generated works to apply for outstanding copyrighted works and cultivating high-value content masterpieces created by artificial intelligence. Through the institutional incentives of copyright and other rights, the legitimate interests of investors and creators can be safeguarded, enabling the field of artificial intelligence, which has both economic and social benefits, to obtain substantial material rewards and spiritual incentives. This will enable more high-quality content resources to reach the international stage. Higher value and benefits can be obtained through the external output and international dissemination of artificial intelligence. At the same time, promote cooperation between right holders and artificial intelligence managers in work creation, give play to synergistic advantages, and drive the improvement of content production quality with channel advantages.

Secondly, vigorously develop the artificial intelligence industry. Accelerate the construction of platform functions such as information dissemination, resource collection, value assessment, development and remodeling, investigation and release, and collaboration and sharing in the artificial intelligence industry. Actively

promote the selection of high-quality artificial intelligence enterprises, and focus on enhancing the social and economic value of this type of industry. Strengthen the capacity building of copyright support for the development of the artificial intelligence industry, expand the industrial chain and value chain of artificial intelligence. Aggregate Internet work resources through outstanding artificial intelligence enterprises, form a model for the development of artificial intelligence, and continuously promote the development of the artificial intelligence industry.

3.5.4. Corporate Copyright Strategies in the Development of Artificial Intelligence

Establishing an Artificial Intelligence Copyright Alliance is necessary. Blindly emphasizing competition often ultimately leads to a lose-lose situation, and the competition among artificial intelligence platforms is becoming increasingly fierce. In the face of such a fierce market competition environment, instead of fighting alone, it is better to establish a copyright alliance among artificial intelligence platforms, achieving a powerful combination to jointly create a favorable institutional environment for the fair use of copyright. In addition to the establishment of alliances among AI enterprises, the copyright operation and protection alliance between right holders and AI platforms should also, through the convenient integration of content resources and the sharing of technical platforms within the alliance, create more valuable content and reports, and bring the "best of ARTO" to AI.

Based on the above-mentioned comprehensive analysis, it can be seen that the response and transformation of the copyright system must have a strategic perspective. The copyright strategy for the development of artificial intelligence includes copyright strategies at two important levels: the national level and the enterprise level. Through the guarantee of external government policies, a favorable environment and development space can be created for the application and protection of artificial intelligence copyright. Relying on the position of enterprises as the main market players, the creation, application, and protection of copyright in the value chain of the artificial intelligence industry can be strengthened, and the sharing of interests between new right holders and artificial intelligence platforms can be realized.

4. CONCLUSION

With the background of foreign affairs and law and the ever-changing landscape of the global governance system, artificial-intelligence-generated creations have brought about diversification in work types and a transformation in the way works are created, presenting unprecedented opportunities and challenges to cultural creation. Copyright Law needs to respond to these changes. From the perspective of economic and relevant theoretical applications, the fair-use system based on a balance mechanism can expand the scope of works created by AI. This enables various AI platforms to comprehensively access information, thus providing guidance for the development of AI technology and the industry. Technically, since the use of original authors' works in the input, mining, analysis, and output

stages of AI-generated creations is highly transformative and does not involve the dissemination of the original work's own expression, it meets the standards of the three-step test. Therefore, applying the copyright fair-use system to it will not affect the potential market of the original work and will not damage the legitimate rights and interests of copyright holders. At the same time, AI-generated creations, which expand on human creations, can promote the development and prosperity of overall social culture and contribute to the improvement of public well-being. Therefore, when extracting existing works for analysis and use in the process of AI-generated creations, supplemented by compensation systems such as collective management and taxation to balance the deficiencies of the fair-use system, as long as it is properly implemented, it will surely promote technological development, cultural dissemination, and social and economic progress. If it does not affect the normal use of the work and there is no unreasonable damage to the legitimate interests of the right holders, it should be recognized as fair use. At the same time, it is necessary to pool the wisdom and efforts of all parties and jointly manage and control. The above-mentioned institutional suggestions can be piloted in the economically developed Yangtze River Delta region. Jointly work with the Legislative Affairs Commission to promote coordinated legislation, and further focus on its specific implementation in terms of principle mechanisms, value orientations, key areas, main methods, and working models.

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