https://doi.org/10.62585/pjcj.v4i1.51

Volume and Issues Obtainable at Centeriir.org
Pakistan Journal of Criminal Justice
ISSN: 2958-9363 ISSN (E): 2958-9371
Volume 4, No.1, 2024

Journal Homepage:https://journals.centeriir.org/index.php/pjcl

Does Pakistan's Copyright and Antitrust Law Protect Creators of AI-Generated Content? A Comparative Study with European Union Jurisdictions

Shahzada Aamir Mushtaq[1] **Khurram Baig**[2] **Syed Wajdan Rafay**[3]
Waqas Ahmad[4]

[1]Assistant Professor, Department of Law, Times Institute Multan, Pakistan. Email**:** amirqureshi.adv@gmail.com
2PhD Scholar University Gillani Law College, Bahauddin Zakariya University Multan. Email: mkb5729@gmail.com
3Lecturer/Deputy Director Student Affairs, College of Law, university of Sargodha Email: Wajdan.rafay@uos.edu.pk
[4]LLM Gillani Law College BZU Multan. Email: waqas1816@gmail.com

ABSTRACT

With the rise of artificial intelligence (AI), how should copyright and antitrust law handle AI-created creative work? The Copyright Ordinance 1962 and Competition Act 2010 are examined in this context to examine Pakistan's legal system. This study compares Pakistan's legal system to the EU's. The study focuses on the DMA and the EU Copyright Directive (2019/790). These two laws measure Pakistan's legal strength. Compare and contrast the legal systems of Pakistan with those of the European Union to find weaknesses and opportunities for progress in Pakistan's legal structure. This study may assist Pakistani policymakers and stakeholders in finding the best methods to adapt and update current regulations to handle the evolving environment of AI-generated content creation. Additionally, the article examines how antitrust laws affect AI-generated material and whether competition limits are enough to prevent AI corporations from monopolizing authors' rights. The article examines monopolization, norms, and AI-powered media. The research intends to illuminate artists' rights issues and identify legal loopholes that might hinder AI-generated material protection. It also suggests clarifying or amending rules to accommodate AI innovation. This detailed study illuminates Pakistan's complex copyright and antitrust relationship with AI-generated material. The findings of the research have added to the digital intellectual property rights conversation by revealing future rules and safeguards for artists working with AI-generated creations. Questions have been raised about how AI-generated material affects creative rights laws. The study begins with Pakistani AI content production IP rights. The research explores authorship, originality, and rights in the future when human programmers and algorithmic computers collaborate on creative creations. The study found that Pakistan's copyright and antitrust legislation does not address rising infringement problems, so aggrieved parties may have to use conventional remedies.

Article History: Received: November 21, 2023: Accepted: December 09, 2023: Published: March 05, 2024
Keywords: Artificial Intelligence (AI), Copyright Law, Antitrust Law, Pakistan, European Union.

Corresponding Author's Email: mkb5729@gmail.com

How To Cite: Aamir Mushtaq, S., Baig, K., Bukhari , S. W. R., & Waqas Ahmad. (2024). Does Pakistan's Copyright and Antitrust Law Protect Creators of AI-Generated Content? A Comparative Study with European Union Jurisdictions. *Pakistan Journal of Criminal Justice*, *4*(1), 55-88

https://doi.org/10.62585/pjcj.v4i1.51

1. Introduction

AI could create music, literature, images, and movies. Few applications are commercially available, although most are in experimental and developing phases. Image-generating services and AI content production tools are examples. Neural networks are used in AI-based content creation ("artificial creativity" or AC). Neural networks can model training input and produce similar outputs using pre-existing data. Neural networks are more powerful than standard computational methods, but teaching them to produce content needs copyright-protected training materials, which are difficult to license owing to the vast number of works required. These findings pose copyright infringement concerns; therefore AC application development depends on whether works and other subject matter may be utilized without rights holder agreement via a copyright exemption or other legal basis. Copyright and other laws must consider the merits and cons of AC for content production since using AC development works without authorization may infringe or free ride on training works (B. Chen & Li, 2023)(N. Chen, 2024).

Though legal academics have examined copyright exceptions for text and data mining (TDM) and transient copying, their significance to AC development raises distinct policy challenges. AC development raises new legal challenges, including as legitimate access and effective reservation. AC development varies from TDM and other AI applications in practice, environment, and goals. This study examines Pakistan's copyright and antitrust laws' existing allowance of works in AC development and how they might accommodate multiple rights and interests (Tan et al., 2024).

Artificial Intelligence (AI) refers to a category of machines that possess intelligence like that of humans, which is achieved via the use of intricate algorithms and mathematical functions. An artificial intelligence system may only be considered as such if it has the capabilities of generalized learning, reasoning, and problem-solving. In essence, it is an artificially designed device that imitates human actions and responses(von Ingersleben-Seip, 2023).

Copyright is a legal safeguard granted to creators of "original works of authorship," encompassing literature, drama, music, art, and select intellectual creations, regardless of whether they have been made public or remain unpublished. In ancient times, individuals with creative talents such as artists, musicians, and writers created their work to gain fame and recognition, rather than solely for financial gain. Consequently, the concept of copyright did not emerge as a concern. The significance of copyright was acknowledged solely following the creation of the printing press, which facilitated the mass production of books. The development of modern copyright has been shaped by various historical legal rights, such as the moral rights of the creator, the economic rights of those who funded the creation of copies, the individual property rights of copyowners, and the government's authority to censor and regulate the

industry. The "**Statute of Anne**" in England is widely recognized as the inaugural copyright law. It was enacted in 1709. This legislation granted authors exclusive privileges for the first time and imposed a time limit on these privileges, after which all works would become part of the public domain(Atilla, 2024)(Opderbeck, 2024).

Competition legal concepts and AI-generated content in Pakistan require thorough examination. Research should investigate any anti-competitive behaviors associated with AI-generated material and the involvement of competition authorities in resolving these matters. Research on intellectual property protection for AI-generated material in Pakistan is limited, with few studies focusing on the unique difficulties and potential in this area. It is essential to comprehend the application of copyright, patent, and trademark laws to AI works to encourage innovation and protect creators' rights. Exploring the ethical consequences of AI-generated material within Pakistan's legal system is necessary. Research should explore the ethical aspects related to ownership, responsibility, and transparency in AI-generated material, by the legal framework(Kazeeva, 2024)(Klobucnik, 2024).

In Pakistan, there is a dearth of information about how the rise in the amount of material provided by AI influences the dynamics of the market. It is important for research to explore the influence that these technologies have on the competitiveness of the market, the choices that customers make, and the emergence of new market players. There has not been a lot of research done to determine how successful it is to enforce competition and intellectual property restrictions regarding content that is created by artificial intelligence. The primary emphasis of research has been on tackling the practical challenges that regulatory organizations and the court face when attempting to enforce existing laws or alter those laws to meet new problems brought about by artificial intelligence. There is a paucity of comprehensive research that offers policymakers in Pakistan proposals that can be put into practice to harmonize competition and intellectual property rules to facilitate content that is created by artificial intelligence. The findings of research have offered policymakers with important knowledge that can be used to develop policies that are both flexible and efficient(Gaffar & Albarashdi, 2024).

There is a dearth of foreign comparative studies that seek to evaluate Pakistan's legal framework for managing artificial intelligence-generated content about international norms. The results of this research would be very helpful in gaining insights into the most effective techniques and potential areas for development within the Pakistani context(Halwachi, 2024)(Dermawan, 2024).

Through addressing these research gaps, a better understanding of the legal implications of artificial intelligence-generated content in Pakistan would be achieved, which would be beneficial to both academic discourse and the creation of policy.

2. Anticipated Contribution

This research piece provides novel insights into the use of competition law and intellectual property legislation for AI-generated material in the setting of Pakistan.

The paper offers an intricate examination of the junction between competition law and intellectual property legislation for AI-generated content in Pakistan. It provides a detailed analysis of the intricate legal processes involved, going beyond superficial evaluations. The study illuminates concerns relevant to the Pakistani context by recognizing and resolving the unique challenges presented by AI-generated material. This involves examining how cultural, economic, and regulatory elements impact the implementation of laws on new technology.

The article incorporates an ethical framework into the legal study, recognizing the wider social impacts of AI-generated material. It delves into the ethical implications of competition and intellectual property in the field of AI, improving comprehension of responsible innovation. The primary contribution is suggesting adaptive techniques for current legal frameworks to enhance their adaptability. The report proposes modifications to competition and intellectual property laws in Pakistan to govern and promote innovation in the fast-changing field of AI-generated content. The study evaluates the practical effects of competition and intellectual property regulations on AI-generated content in Pakistan, moving beyond

theoretical discussions. The text provides practical insights on the efficacy of these regulations and their impact on market dynamics and innovation.

The study involves engaging with and considering viewpoints from many stakeholders such as legal practitioners, policymakers, and industry experts in Pakistan. This comprehensive method enhances the analysis and guarantees that the suggestions are in line with the real requirements and obstacles encountered by individuals in the AI field. This article provides policy ideas customized to the unique circumstances of Pakistan, rather than offering general suggestions. The report offers practical suggestions for policymakers to align competition and intellectual property rules in order to provide a favorable climate for AI innovation.

This research piece provides a detailed and novel examination of how competition law and intellectual property laws apply to AI-generated material in Pakistan, considering the particular environment and ethical considerations. It connects theory with practice, offering useful insights for academics, politicians, and industry stakeholders.

3. Recent Developments

3.1. Sarah Silverman and others vs. Meta, Open-AI for Alleged Copyright Infringement

The recent battle between tech firms in the USA which is going on to determine the future legacy of content created by AI is taking new dimensions**.** The vicarious copyright infringement claim asserts that responses produced by OpenAI's ChatGPT program constitute an infringing work that is only made possible by data extracted from copyrighted material, in this example, Silverman's book "The Bedwetter," as well as works by other authors, including Tremblay's "The Cabin at the End of the World." Additionally, a claim under the Digital Millennium Copyright Act was rejected. This act "restricts the removal or alteration of copyright management information [also known as CMI]" including authorship, title, and copyright owner. Plaintiffs have not demonstrated how removing CMI from the copies used in the training set gave Defendants reasonable grounds to know that ChatGPT's output would induce, enable, facilitate, or conceal infringement, even if Plaintiffs have presented evidence of Defendants' knowing removal of CMI from the books during the training process." The assertions of producing and disseminating "derivative works" were also rejected. Initially, "every output from the OpenAI Language Models is an infringing derivative work," according to Silverman and the other plaintiffs.

That was done "without providing any indication as to what such outputs entail – i.e., whether they are the copyrighted books or copies of the books," the court decided, finding it "insufficient" to substantiate their claim under the Digital Millennium Copyright Act.

"Assuming the truth of Plaintiffs' allegations – that Defendants used Plaintiffs' copyrighted works to train their language models for commercial profit – the Court concludes that Defendants' conduct may constitute an unfair practice," the court did sustain the unfair competition claim. As a result, the UCL [The Unfair Competition Law of California] suit may go forward with this component." It will be very difficult to establish in many instances since in addition to their novels, they also have Broadway plays, movies, podcasts, and books out right now. It will thus be extremely difficult to relate anything back to this open AI language paradigm."

The legal actions taken by the New York Times (NYT) against Microsoft and OpenAI have created a new arena for the continuing legal disputes resulting from the use of copyrighted material to "train," or enhance, generative AI. Numerous legal actions have already been taken against AI firms; one such case was launched by Getty Images against StabilityAI, the company that produces the online text-to-image generator known as Stable Diffusion. Authors John Grisham and George R.R. Martin have also filed lawsuits against OpenAI, the company that owns ChatGPT, alleging copyright violations. But since the NYT case adds compelling new reasons to the mix, it is not "more of the same."

The lawsuit centers on two additional issues: the worth of the training data and reputational harm. This combination of copyright and trademarks is strong enough to challenge commonly used claims of fair

usage. Along with this, the complaint makes a unique argument—one not supported by prior, comparable cases—about a phenomenon known as "hallucinations," in which artificial intelligence (AI) produces erroneous or misleading information and presents it as truth. It's possible that this is the strongest argument in the case.

Three unique perspectives on the standard methodology are brought up by the NYT case in particular. First off, material from the New York Times has more value and appeal as training data for artificial intelligence (AI) systems because of their reputation for reliable news and information. Second, the barrier makes it economically detrimental to reproduce content on demand. Third, ChatGPT "hallucinations" are essentially creating incorrect attribution, which is harming the New York Times' reputation.

This kind of assault has difficulties because of the fair use shield. A legal theory known as "fair use" in the United States allows the use of copyrighted content in certain contexts, including academic research, news reporting, and commentary. Though OpenAI has been quite circumspect in its reaction so far, one of the main points in a statement issued by the corporation is that their usage of internet data does, in fact, come under the purview of "fair use."

The New York Times has taken a somewhat different tack in anticipation of some of the challenges that a fair use defense of this kind may present. It aims to set itself out from conventional data in particular. The New York Times plans to use its purported reporting qualities—accuracy, reliability, and prominence. It asserts that doing so produces a highly appealing dataset. This is not just typical copyright case involving generative AI. First, the New York Times argues that the training phase of ChatGPT violated copyright since the training data utilized by OpenAI is protected by copyright.

3.2 Pakistani Perspective

The Copyright Act of 1914 was the initial legislation on copyright in Pakistan. The U.K. Copyright Act, 1911 served as the model for it. The Copyright Ordinance of 1962 superseded the previous Copyright Act of 1914. Nevertheless, the Copyright Ordinance of 1962 was modified by the Copyright (Amendment) Act of 1992 to broaden the range of material protected and to enhance the strict implementation of copyright laws.

Registering a work with the Registrar of Copyrights is not mandatory in Pakistan for securing copyright protection. Instead, copyright protection is granted to the original creator immediately upon the creation and recording of the work in a tangible format. In the case of Messer’s Ferozesons Pvt. Ltd. v. Dr. Col. Retd. K.U. Kureshi and others {2003 C L D 1052(Lahore)}, the Court ruled that the copyright remains valid and unaffected even if it is not registered. Furthermore, it does not nullify the entitlement to file a lawsuit for copyright violation. The court acknowledged that copyright registration is not mandatory, but it does establish strong initial evidence of authorship and the existence of copyright in the work, particularly in the event of a dispute.

It is crucial to understand that ideas do not have copyright protection. Instead, it lies in the manifestation of the concept. In the case of Independent Media v. Ali Saleem and Anr. {2006 C L D 97 (Karachi)}, the Court ruled that copyright law does not safeguard an abstract concept, but rather the specific manifestation of that concept.

Pakistan loses an estimated PKR 9 billion (equivalent to approximately USD 114 million) in annual revenue due to the illegal copying and distribution of videos, textbooks, and consumer goods. The total amount consists of PKR 3 billion, equivalent to approximately USD 38 million, derived from video piracy, and another PKR 3 billion obtained from consumer product piracy. An amount of PKR 1.5 billion, equivalent to approximately USD 19 million, has been obtained through the illicit activity of textbook piracy. In 2007, Pakistan was ranked as one of the most egregious perpetrators of software piracy by the Business Software Alliance, in collaboration with international research firm IDC. The report indicates that the piracy rates in Pakistan stand at eighty-four percent. Moreover, it has been documented that the act of illegally distributing cable and satellite signals resulted in a staggering $110 million in financial losses for legitimate channels in 2007. This illicit activity reached an estimated 4.6 million unauthorized

subscribers. Pakistan is widely regarded as a center for book piracy, with specific markets in Karachi and Lahore serving as the primary origins of pirated books within the country. According to estimates, book piracy in 2007 led to a trade loss of $55 million.

3.3.Copyright Protected Works in Pakistan When copyright infringed

Works that are safeguarded by copyright law in Pakistan include original literary, dramatic, musical, and artistic works, as well as cinematographic films and records. Under Article 56 of the Ordinance Copyright in a work shall be deemed to be infringed:-

(A) If any individual, without the owner's consent or a valid license granted by the owner or the Registrar under this Ordinance, or in violation of the terms of a granted license or any conditions imposed by a competent authority under this Ordinance:

(i) Engages in any activity that is exclusively reserved for the copyright owner under this Ordinance; or

(ii) Allows a place to be used for profit in a public performance of the work that infringes the copyright unless they were unaware and had no reasonable grounds to suspect that such performance would be an infringement of copyright,

(B) If any individual:

(i) Engages in the act of selling, renting, trading, displaying, or offering for sale or rent,

(ii) Distributes, to an extent that negatively impacts the copyright owner, for trade, (iii) Publicly exhibits for commercial purposes,

(iv) Imports into Pakistan any copies of the work that infringe upon the copyright.

3.4.What does not constitute copyright infringement in Pakistan?

The subsequent actions shall not be considered as copyright infringement:

1. Fair dealings as outlined in article 2 of this Ordinance
2. Reporting current events
3. Judicial proceedings
4. Political speech reports
5. Educational use
6. Records for Educational use
7. Limited audience performance
8. Amateur performances
9. Artistic works in public places
10. Reports of lectures
11. Libraries and research
12. Government publications
13. Cinematograph film
14. Architectural works
15. Exhibition of expired copyright films

The subject matter offers an intriguing and contemporary problem with important consequences for technology and law. For a thorough study, there are a few research gaps that must be filled, though:

Pakistan's unclear laws governing the protection of AI-generated material

It's not clear whether AI-generated material is included under the categories of "literary, artistic, musical, or cinematographic works," as defined by Pakistan's Copyright Act of 2018. There is a dearth of authoritative interpretations and case law, which leaves makers and users in the dark. The area that needs further investigation is how to interpret or modify current copyright laws to explicitly target work created by artificial intelligence.

Limited comprehension of the ramifications of antitrust laws:

In the Pakistani context, the possible anti-competitive consequences of big tech corporations controlling access to AI technologies and data have not been investigated. More research is required to determine if Pakistan's Competition Act 2004 may be utilized to address issues with data access and possible market dominance in the AI industry.

Inadequate study of comparison with the EU

Although the study primarily focuses on the EU, a more thorough examination of certain EU laws, such as the Directive on Copyright in the Digital Single Market, and how they relate to Pakistan is required. Insights for Pakistan may be gained from a comparative study that goes beyond legislative frameworks to

take into account actual application and enforcement inside the EU.

Disregarding social and ethical aspects:

The ethical issues of ownership, originality, and possible biases in material created by AI are not sufficiently explored in the research gap. The Pakistani environment hasn't addressed the social ramifications of broad AI content development, such as job displacement or cultural effects.

Ignoring substitute legal structures

The lack of research prevents alternative legal frameworks like database protection or sui generis rights from being investigated as viable means of safeguarding information created by artificial intelligence. Analyzing unconventional methods may provide insightful information for modifying Pakistan's legal system.

4. Methodology

Doctrinal study helps understand the legal environment and suggests changes to preserve Pakistani AI-generated artists' rights. Legislation, case law, and regulatory frameworks are analyzed to establish whether Pakistan's Copyright and Antitrust Law protects AI-generated content providers. The investigation will begin by evaluating Pakistan's Copyright Act and Antitrust Laws for AI-generated work and author rights laws. Legal commentary, academic articles, and legal expert publications have been examined to comprehend AI-generated content and copyright and antitrust laws to deepen the doctrinal study. Comparing Pakistan's legal system to international standards and precedents has revealed gaps and chances for development.

Two essential research approaches used to investigate the anticompetitive behaviors of digital platforms are doctrinal research and case law analysis. A thorough examination and study of pertinent scholarly works, legal precedents, and legislation is required for doctrinal research. By using this technique, scholars may provide a theoretical framework for comprehending antitrust regulations and how they relate to digital platforms. However, case law study research focuses on particular court decisions that have anticompetitive actions in the digital sphere. Scholars examine cases, court rulings, and legal arguments to get important insights into how antitrust enforcement is changing in the digital era. By combining these approaches, one may get a sophisticated knowledge of the legal issues related to anticompetitive behavior, which is useful in establishing legislative frameworks and policy interventions in the quickly changing digital landscape.

5. Artificial Intelligence and copyright

Chapter 1, Section, 3 and Chapter 2, section 10 defines the meaning and work that will get copyright respectively under the copyright ordinance of Pakistan, 1962. Copyright law only recognizes the creation of original minds; that is, they should have a human author.

The integration of Artificial Intelligence with artistic creations has been seen since the 1970s. Artificial Intelligence technologies have been used and continue to be utilized at an elevated degree in the domains of literary composition, journalism, music production, visual art, and gaming. Google is the owner of an artificial intelligence (AI) business called Google Deep Mind. The deep learning algorithm used by this organization operates without explicit rules, instead adhering to a guiding principle of continuous learning. In terms of its development, the computer program can produce music while simultaneously analyzing audio recordings (Bendel, 2023).

The Copyright Ordinance of Pakistan 1962 explicitly provides definitions for the terms "author of a computer program" under Section 2(d)(i) and "computer program" under Section 2(d)(p). The computer program is subject to copyright as a kind of literary work, and this copyright may be safeguarded for 50 years after the author's death. However, the question of whether the creative work produced by artificial intelligence (AI) is protected by copyright laws will be a subject of debate. The US Copyright Office has recently established regulations about the use of artificial intelligence in the production of fresh creative creations. These regulations specify that copyright protection will only be bestowed upon the portion of

the work that has been generated by a human, excluding any contributions made by AI.
In the significant legal dispute between Infopaq International A/S and Danske Dagblades Forening in 2009, the Court of Justice of the European Union established that a work produced by a computer program is eligible for protection under copyright law only if it incorporates the author's originality. While there is no explicit prohibition on copyright for AI-generated art, the rules are not favorable towards works that lack human inventiveness (Budhwar et al., 2023).

6. Pakistan's Competition Law Framework

Section 3(2)(b) and (h) of the Pakistani Competition Act 2010 address abusive trade practices and discriminatory prices, while section 4 deals with prohibited or restricted agreements that hinder competition in the economic market. However, the traditional application of these provisions in cases of violation may not effectively address the technological challenges arising from recent developments in the European Union, United States, and China related to technological changes in digitization as economies shift. In May 2023, Pakistan's Ministry of IT & Telecom unveiled the Draft National AI Policy, which is a component of their Digital Pakistan goal. The objective of this Policy is to convert Pakistan into an economy that relies on knowledge and to provide an environment that is favorable for the responsible use of AI. The Policy underscores the need to adhere to global efforts by prioritizing the ethical and responsible use of AI. It also promotes the allocation of resources towards the enhancement of research and development infrastructure. Additionally, it tackles issues related to job displacement and explores ways to harness AI to foster economic growth. (Chintalapati & Pandey, 2022).

6.1 The aims and goals of the Draft National AI Policy of Pakistan

The Policy acknowledges the profound impact of AI and its capacity to bring about significant changes in society and the economy. To maintain a concentrated strategy, the Policy establishes precise objectives that must be accomplished by 2028. The objectives encompass broad dissemination of knowledge about AI and related technologies, cultivating a proficient workforce, enhancing the skills of the current workforce, incorporating AI into education, establishing a National AI Fund, establishing Centers of Excellence in AI and Allied Technologies, and revolutionizing the public sector through AI. The objectives of these aims are to advance Pakistan's AI development and enhance its worldwide recognition, while also assuring the responsible and inclusive deployment of AI.

7. Who will be the owner?

The fundamental inquiry surrounding the novel artistic output produced by an artificially intelligent system pertains to the rightful ownership of such work. Whether it is the software developer? The user using the AI? Or the AI system itself? Typically, the creator of a generated work has the copyright. However, if the author is an AI program, this general rule cannot be applied. For the AI program to be acknowledged as the creator of the work it produces, the AI machine must be given the legal standing and entitlements of a human being.

Currently, when artificial intelligence produces artistic content, often that aspect is not eligible for copyright protection, and only the human ingenuity within the piece is subject to copyright. The reason is that AI does not generate original work; it replicates what it has learned via its programming. Due to the inherent nature of AI software, the creative output it generates will have a significant resemblance to the information it has been trained on. Chat-GPT has streamlined the intricate writing process into a single click, revolutionizing the world of writing. AI software acquires knowledge from vast amounts of data and applies it in the generation of novel creations. AI can operate for a limited duration and produce intricate tasks that may be beyond the capabilities of people to do individually. The world has been astounded by the groundbreaking artwork 'The Next Rembrandt', which utilizes state-of-the-art information technology to revive the classic age of masterpieces via the application of artificial intelligence (Akhtar et al., 2023).

8. Infringements on Copyright in the Development of Applications for Artificial Creativity

Neural networks are a fundamental technology that underlies contemporary AI applications. Neural network training entails inputting data into the network's input nodes, which is then propagated via succeeding layers and ultimately reaches the output nodes. Through the process of analyzing the outputs produced by a neural network and making adjustments to its parameters, the network can gradually improve its performance and provide more favorable outcomes with repeated training sessions. For example, if the goal is to create an image of a fox, the network's parameters can be adjusted to progressively produce outputs that resemble a fox more closely.

Neural networks for AC applications need content-specific training resources. Creative resources typically have copyright or associated rights, which may be violated during teaching. First, data collection and preparation for neural network training may need replication. Reproducing complete fox photos to convert them to the proper format is probable.

Furthermore, the utilization of copyrighted content to train neural networks can involve the manipulation of data in manners that amount to reproduction. When data is inputted into a neural network, there is a possibility of direct replication of the training data. For instance, the inputs at that specific moment may accurately replicate all the pixels of the image depicting a fox. However, it is possible to prevent copyright infringement at this level by utilizing small portions of copyrighted works, such as brief text samples, as long as the reproduction of protected elements is avoided at any given moment (Khan et al., 2023).

Data is processed in sophisticated ways as it moves through a neural network's layers, preventing direct input violations. For instance, the fox image's pixels may be modified with other pixels to hide crucial aspects from the neural network. After learning to reproduce data attributes, a neural network may also replicate protected sections of the works used in its training. For example, it is permissible to replicate portions or distinctive elements of training materials that are subject to copyright protection, such as certain parts or characteristics of an image.

Inevitably, the outcomes generated by neural networks while being trained or utilized in applications may also encompass unauthorized duplication of protected segments extracted from the sources employed to train the system. The assessment of whether the generated outputs infringe upon the intellectual property rights of the training materials is contingent upon the neural network's design and the particular context in which it is implemented (Vimalnath et al., 2023).

9. Copyright exceptions that allow works to be used in AC development (European Perspective)

At different phases of AC development, copyright holders' reproduction rights may be affected. Refusing to reproduce copyrighted content is tough, especially in the beginning when complete works are copied. Later reproduction of protected components may violate neural network training materials. Unless licensed, copyright-exempt, or otherwise authorized, this is a violation.

Unfortunately, the training of impartial networks may require a substantial volume of protected material, potentially reaching hundreds of millions of pieces. These works may be subject to multiple rights holders and may be simultaneously protected by various forms of copyright, including sui generis database rights, related works rights, or related rights. The absence of centralized or coordinated licensing procedures renders obtaining authorization to utilize substantial quantities of subject matter unattainable. This is due to the economic impracticality associated with identifying the rights holders, let alone negotiating licensing agreements with them. The justification for employing works without authorization may be supported by the prohibitively high transaction costs that impede the attainment of advantageous results, under certain conditions. It is also possible to justify permitting the use of works without the consent of the copyright holders—even if consent were possible—on the basis of the public benefits it promotes, including the facilitation of technological progress and improvements in the creation of the content it authorizes (Bang & Park, 2023).

The current exceptions in EU copyright law, such as the temporary copying exemption and the exception for Text and Data Mining (TDM), already permit the utilization of works in Artificial Intelligence (AI) development. However, the extent to which they can achieve this is hindered by uncertainties regarding the suitability of specific exceptions and the technological and other challenges in meeting their needs for AC development.

In the following analysis, we examine how these exclusions can be applied to the development of AC, identifying possible challenges and proposing strategies to address them within the framework of EU copyright law.

9.1 Text and Data Mining Exemption

The Directive on Copyright in the Digital Single Market (DSM Directive) exceptions for Text and Data Mining (TDM) are regarded as one of the most viable alternatives for facilitating the development of algorithms for artificial intelligence (AI).

According to Article 4 of the DSM Directive, it is allowed to reproduce resources that are lawfully available for Text and Data Mining (TDM) purposes, as long as the right holder has not explicitly reserved that right. The scope of this exception extends beyond non-commercial research, unlike the TDM exception in Article 3 of the DSM Directive. Instead, it applies to any individual or organization and any purpose of TDM. The general exemption for temporary reproductions of protected subject matter in the context of transient and incidental digital network transmissions, as outlined in Article 4 of the DSM Directive, provides some coverage for the use of protected subject matter in artificial intelligence research (Rosak-Szyrocka et al., 2023). However, certain conditions of this exception impose restrictions or create difficulties that impact the development of artificial intelligence, as shown in the following discussion.

9.2. Concept of Text and Data Mining (TDM)

The primary source of doubt pertains to the core of the exception - the notion of TDM itself. The Directive defines TDM as actions that seek to produce information, including patterns, trends, and correlations. This broad definition encompasses the concept of AC development, which involves examining the training data to generate information such as neural network parameters or outputs that capture patterns and correlations in the data. However, it is important to note that the definition of TDM cannot be all-encompassing and includes every possible usage of works conducted by automated processing.

9.3. Right Holder Reservations Preventing Application of the Exception

Moreover, although TDM and AI share some similarities and distinctions in their objectives and methodologies, they are not synonymous. The Commission's proposal for the DSM Directive recognizes TDM as a method for extracting information from data analyses, including scholarly literature. Nevertheless, the explicit mention of the utilization of works in the advancement of AI is absent.

However, the aforementioned presentation of a restricted comprehension of TDM lacks justification. The exhaustive definition of TDM and the examples provided in the Directive are not initially constrained by this interpretation of TDM. In addition, as stipulated in Article 5.3.3 of the InfoSoc Directive, the normal exploitation and legitimate interests of copyright holders must remain unaffected by the three-step test. This obviates the necessity to impose limitations on the definition of TDM, and an inadequate understanding of TDM would similarly hinder the implementation of applications that produce societal benefits without encroaching upon copyright holders. In essence, right proprietors possess the authority to veto the application of the exception through the creation of a reservation. This enables them to protect their motivations and interests, which will be addressed in greater detail later on.

The exception for Text and Data Mining (TDM) stated in Article 4 of the DSM Directive does not apply if a copyright holder explicitly restricts the use of their works or other content for TDM using technological or other suitable methods. If a reservation has been made in a proper manner, then the use of those materials is prohibited under the exception for AC development. If a substantial number of

copyright holders express reservations, the ability to utilize materials for AC development is thus restricted (Zhao & Gómez Fariñas, 2023).

It might be difficult to determine the lack of a legally enforceable reservation when comprehensive training materials are used. For instance, pre-prepared datasets may not be reserved. Material lawfully available from another source, such as where the dataset subject matter was received, may nonetheless be reserved. Article 4 of the DSM does not specify where to make a reservation for effect. It merely demands a clear and appropriate reservation. A valid reservation could have been filed elsewhere than the location where the mined minerals were collected, even if reservations are submitted in a standardized, machine-readable format. It can be difficult to determine whether the reservations were made by service providers or right holders (e.g., prohibiting reverse engineering or similar methods or storing available content) or whether the language used in the terms of service constitutes an effective reservation (Bozkurt et al., 2023).

Legal issues make it difficult to validate automatic or manual reservations. Therefore, the TDM exemption may not cover the usage of certain material to develop AC applications. Recently, an artificial intelligence (AI) creator or distributor of data sets recognizes copyright holders' complaints to their works being included. These models may help right holders manage reservations under the TDM exemption. These models provide legal certainty to TDM participants by identifying works not eligible for use under the TDM exemption and allow more precise reservation modification to target a specific AI developer or dataset. This contrasts with source or other reservations that ban TDM utilizing the resources. However, reservations made by right holders in other places (such as other sources of works, unrelated to sources, or not in a machine-readable format) should not be valid if Text and Data Mining (TDM) participants cannot automatically or fairly identify them. This strategy would also require TDM exception users to declare their materials and sources. This disclosure lets copyright holders voice concerns about their works (Sohail et al., 2023).

9.4. Lawful Accessibility of Works

The exemption only applies to legally accessible works and other subject matter, which adds to the uncertainty. Legal accessibility is not defined in the DSM Directive and does not fit with independent EU terminology like legal usage. Subscription databases and other sources with explicit licenses usually meet these criteria, however some remain unsure. The premise is flawed because copyright law only partly protects access. Copyright grants exclusive rights for reproduction and access to works, not access to the works themselves. It is unclear how circumventing technological safeguards, breaking licensing or other agreements, or avoiding geo-blocking impacts DSM Directive’s lawful access. Accessing works may require illegal acts; however this doe Access to works is typically permitted by copyright law; however, unpredictability could impede the expansion of AC. Certain Member States of the European Union assert that lawful access is denied in cases where the copy, which was intended for future replication of the Technology-Defined Material (TDM), has been unlawfully reproduced, made public, or technological safeguards have been circumvented. Databases of such magnitude render it unfeasible for AI engineers to authenticate source materials. Because the copyright status of source works is typically not disclosed to the public, this criterion would restrict mining to authorized sources. The technique assumes that the source copy utilized for TDM possesses a distinguishable copyright status, which often fails to materialize due to the possibility that it originated from unauthorized circumvention or infringement. Equally reasonable would be the requirement that TDM participants assume responsibility. This process entails assessing the reliability of data sources, including content-sharing platforms, reputable websites, and counterfeit websites, among other relevant factors, to ascertain the legal accessibility of the subject matter being extracted (Chakraborty et al., 2023).

10. How the TDM Exception can be used for AC Development

The TDM exemption, as defined in Article 4 of the DSM Directive, permits the development of automated content (AC) under various situations and encompasses a broad spectrum of works and associated rights, such as press publishers' rights and sui generis database rights. Nevertheless, the TDM exception is not applicable if the owners of the rights have explicitly retained the right to do data mining. Determining the absence of such reservations can be challenging, especially in the context of extensive datasets. Additionally, the Directive does not impose any restrictions on the location or beneficiaries for which these reservations might be made. To address these concerns, it is important to acknowledge and endorse the emerging organizational models that are being developed to control reservations, especially when interpreting exceptions. Furthermore, the lack of clarity on the definition of "lawfully accessible" subject matter poses a challenge for AC developers. This is because various interpretations necessitate an examination of the copyright status of the works and subject matter used in AC development, including its origins. Instead, this criterion should be interpreted as simply necessitating that the miner can consider the content to be legally accessible based on the source and other relevant circumstances.

AC development may benefit from EU copyright legislation's temporary copying exemption (Article 5(1) of the InfoSoc Directive).The exemption applies when replication is transitory, incidental, part of a technical process, and done for reasonable purposes. The copied material must also have no commercial worth.

This kind of copying was not intended for the temporary copying exemption. The purpose was to reduce temporary duplication during consumption, access, and transfer, not content creation. The CJEU states that Article 5(1) of the InfoSoc Directive promotes technological innovation and technology usage while balancing copyright holders' and creative work users' rights. As mentioned below, the temporary copying exemption may be utilized for AC development to encourage technology development and usage fairly and by CJEU criteria.

11. Making copies is an important part of technology

For the temporary copying exemption to be applicable, the act of copying must initially form an essential component of a technological procedure. This implies that replication does not take place beyond the scope of the procedure and that replication is required for the accurate and effective operation of the procedure. The presence of this situation does not hinder the development of artificial intelligence (AI) systems based on neural networks, as the replication of training data is often essential for the accurate and effective training and utilization of such networks.

The training and utilization of neural networks undeniably involve a technological procedure that heavily relies on the repetitive replication of the training data, without which the process would be impossible or significantly less efficient. Additionally, reducing the number of copies or minimizing the level of duplication may lead to subpar performance of the neural network and decrease the probability of achieving successful training. AC development can fulfill this condition provided the training data is only used for its intended purpose and the method is suitably constructed (Singh et al., 2023).

12. Copying is Temporary and Incidental

Reproduction, a vital part of technology, must be temporary or unintentional. Transient copying occurs when copies are manually or automatically deleted. Transitory copies are non-permanent and automatically removed after the technical procedure. No matter its preservation, it is irrelevant if it serves no function other than being part of the technical method.

The reproduction during neural network training might be transient, ephemeral, or accidental, according to CJEU case law. Neural networks destroy data as it passes through them. So, training copies are transitory and fleeting. Further duplicates formed during neural network creation and uses are neither automatically nor manually removed. When training neural networks materials are gathered. Because they are not routinely deleted, training dataset efforts are not transitory. Using a compressed file to repeat

training materials, a trained neural network may be regarded as a permanent copy. Accidental copies may occur if not automatically deleted. Do not duplicate for non-technical reasons. The use and construction of neural networks need datasets. Unless the copies are utilized elsewhere, they are incidental. However, accidental duplicates preserved without the intention of automated or human deletion may not be temporary. To avoid this problem, frequently evaluate datasets to prevent permanent work retention and ensure their non-temporary character.

The temporary copying must be for "lawful use" to qualify for the exemption. Lawful use is the use of a work that is allowed by the copyright holder or not limited by EU and national copyright laws. This condition can be fulfilled in cases where the main aim is to create an AC programmer that does not violate copyright laws. This is particularly true where the results of the AC application do not violate the training materials by copying their protected characteristics or sharing them with the public (or if copying them is allowed under another exception). The Court of Justice of the European Union (CJEU) has determined that the act of creating summaries of news stories, that are not in violation of national laws, can be recognized as a legal activity. While it may be challenging to eliminate certain outputs of artificial intelligence (AI) applications that include protected elements from the training data, it might be argued that it is sufficient for the activity to have a permissible aim. It is not necessary to completely avoid unintended infringement (Hartmann & Shajek, 2023).

13. **Absence of autonomous economic significance**

The ultimate condition for the temporary copying exemption is that such copying must not possess any autonomous economic importance. Consequently, any temporary copying should not generate the economic worth that is separate from the value derived through the legal utilization of the works. Generating profits by granting access to temporarily duplicated works hinders the fulfillment of this requirement, as does the temporary duplication that leads to alterations in the content, so enabling the exploitation of the works in a modified format. For instance, in cases where the use of copyrighted works does not violate the law and is considered legal, making temporary copies solely to facilitate such legal use can meet the criteria of copying without any separate economic value.

TDM may generate autonomous economic value via information and knowledge, hence this might hinder it. Training neural networks for AI development might provide economic value by temporarily replicating works to give them useful skills. As the copying would have independent economic value, the exemption would not apply.

However, CJEU case law allows an alternative interpretation: copying without independent economic significance is necessary to prevent temporary copying from being used to profit by granting access to temporary copies or exploiting works beyond the authorized use. Temporary duplication that makes works available in a foreign language is the illicit exploitation of works, in which No legal precedent requires value to be created without reusing copied works in a comparable or changed way. As an extreme example, using computer heat to heat a building may have economic value independent of job value. Neural networks are trained without protected works. They only reflect abstract or non-infringing work features. Thus, exploitation of protected works does not generate economic value. For instance, if trained neural networks are valued by their ability to perform English grammar tasks and cannot reproduce copyrighted elements from the training material, then temporary copying can only be used to create a non-infringing neural network. This value is distinct from duplicating the works, which are never used, even updated. Copyright holder or legislation forbids. The policy shouldn't stop non-protected works from creating value. First, although profiting from copying non-protected material may inhibit innovation, Article 5(5) of the InfoSoc Directive safeguards regular exploitation and copyright holders' legitimate rights. No limitation is needed under Article 5(1) of the InfoSoc Directive exemption. Article 5(5) of the InfoSoc Directive's three-step method better safeguards copyright holders' rights and purposes. This test considers exceptions' effects. The necessity for temporary copying, which has no commercial value, benefits the person making them rather than the copyright holder. Duplicating non-protected labor

components to prevent value creation is damaging, under Article 5(1) of the InfoSoc Directive. Copyright-free socially beneficial activities would be prevented. New value generation from non-protected sections of works benefits society more than the replication of protected attributes (Kambur & Yildirim, 2023).
Thus, the proposed interpretation requires the AC software to not provide outputs that may be used to unlawfully exploit copyrighted information. However, copyrighted training materials may be utilized commercially if trained neural networks create outputs like automatic translations or changes. This invalidates the exemption. Thus, neural networks must provide outputs that do not infringe copyright rules and do so with high confidence to prevent them from being utilized as a replacement for the original training works, satisfying the criteria of having no independent economic importance.

14. AC Development's Eligibility for the Temporary Copying Exemption

The interpretation of the transient duplication exemption can be influenced by CJEU case law, which permits copyright-free outputs to be generated during neural network training. Ensure that all duplicates are eliminated automatically, or frequently update the datasets. Additionally, the outputs must not infringe. The provisional duplication exemption, nevertheless, is limited to copyrighted works and does not extend to databases or computer programs. It also excludes content protected by the associated rights of phonogram and performing artists, as well as fixations on film and broadcast. This exemption forbids the use of copyrighted or sui generis datasets in the development of artificial intelligence systems. The classification or processing of training materials (e.g., by subject matter or other attributes) could potentially impede the development of artificial intelligence systems. Such efforts may produce a legally protected database, which would not qualify for exemption under the temporary duplication exception. The inconsequential nature of the transient duplicating exemption limitation is maintained if the TDM exception is applied to AC development, as it still permits database utilization (Shah et al., 2024).

15. Three-Step Test Effects on TDM and Temporary Copying Exceptions

In the specified scenarios, the TDM and transient duplication exceptions permit AC development to utilize secured content. The exceptions may only be applied by a national court by the three-step criteria. Exceptions are not to be utilized exclusively in extraordinary circumstances that do not contradict the customary use of the work or other subject matter, nor should they cause unjust harm to the copyright proprietors, as stipulated in the requirements. Exceptions to AC application development may contravene the criteria that normal exploitation of works should not be delayed and legitimate interests of rights holders should not be unduly injured. As a result, the test is crucial in AC development. Application development work (Ad) infringement, imitation, or exploitation by AC programs may result in injury to both copyright holders and users.
A case-by-case review of the predicted implications of applying an exception to AC development is needed to evaluate if it harms regular work usage or legitimate interests. AC application functions, performance (such output quality), and market scenario vary substantially. The categorization of the AC application's outputs is crucial to assessing rights holders' damages. AC application outputs may infringe on neural network training materials, regular work exploitation, and copyright holders' legal rights. The exemption may not apply because this harm may not pass the three-step test. The exception to a designed AC application may hurt sales in the content product market where the works are disseminated. This might hinder normal use of the works and jeopardize the authors' legal rights (Kathuria & Tandon, 2023).
AC applications that create rights-free outputs may also violate the three-step criteria. This problem is important since AC apps may produce novel content without infringing on current works, competing for training materials. AI may create vast amounts of text summaries and imitations of creative works that, although not copyright-violating, reduce copyright holders' profits. If direct actions cannot be used to stop the creation of such widely produced outputs, the question of whether these AC uses are allowed becomes critical. If an exception enables the following non-infringing behaviors, the three-step test may fail. Due of this, the CJEU opposes transitory copying that allows non-infringing conduct like private viewing.

Permitting transitory copying would harm legitimate usage of works and copyright holders' legal rights. Regardless, the problems associated with the three-step test can be circumvented, and the TDM and temporary copying exceptions can be utilized where the results of an AC programed under development would not violate the utilized works or exploit the efforts of copyright holders, as previously mentioned. However, in situations where an AC application does not fall within this category, but still produces infringing content, national courts must assess the potential effects of that particular AC application on the lawful interests and regular utilization of authors (Alkhwaldi, 2024).

16. Mechanisms of Antitrust to Facilitate Access to Training Data Protected by Copyright

While copyright exceptions permit the unauthorized use of works in the development of AC applications, they do not pertain to all objectives of AC development or protected material. Further restrictions might apply to these exclusions. Copyright holders may restrict AC development access to or use of works through contractual agreements, technological mechanisms, or other means, by EU copyright law. Even if the transitory reproduction exemption or TDM exception applies, technical, contractual, or other restrictions that could impede exempted activities are permitted under EU copyright law.

EU antitrust legislation can effectively tackle these barriers to AC growth by mandating that copyright holders offer access to their works and issue licenses for their utilization. Consequently, it serves as a valuable addition to the existing copyright exceptions. Antitrust measures can only be applied to enable and facilitate access to and use of works in cases where the practices involved are considered abusive due to a dominating position or a restrictive agreement. However, it should be noted that limitations on access to or use of copyright protected items do not inevitably or commonly fall under this category. The following analysis explores the conditions under which antitrust measures can enhance the availability and utilization of copyrighted training materials in the context of AC development. Additionally, it considers the constraints that antitrust may encounter in achieving this objective (Usama et al., 2024).

16.1 Refusing to License or Access Data for Artificial Creativity

The antitrust laws may impose restrictions on businesses that obstruct the utilization of copyrighted training materials. A dominant market IP holder may engage in oppressive conduct, according to the Court of Justice of the European Union (CJEU), if the following three conditions are met: 1) the IP holder's denial of access or utilization of the IP hinders a licensee from launching a novel product that the IP holder does not sell; 2) the IP is indispensable for conducting business in a related industry; and 3) the IP holder's denial is justified by the requirement of refusal, which encourages the dominant business to advance.

Abuse would occur if a copyright holder with a dominating position in a supply market denied an AC developer a license or access to their resources. License rejections for AC application development might slow product development, including new content, apps, and services. Many grounds for banning a new product might hurt technical innovation or customers.

However, it is highly unlikely that the supplementary standards for abusive denials will be fulfilled in the realm of applications involving artificial creativity. At the outset, substantial influence in a given market is confined to a minority of copyright holders, not all of whom even participate in a product market (e.g., a content market) that adheres to the rights. Conversely, they exclusively grant licenses to third parties for their works. Abuse of intellectual property (IP) is inconceivable in the absence of an IP holder's participation in a product market that follows the IP, according to this line of legal precedent. The reason for this is that the misuse is limited to situations in which the IP holder hinders the entry of competitors into a market that follows the real or imagined IP market (Mannuru et al., 2023).

Furthermore, a license is not always essential for AC developers to function in the product market. Artificial creativity programs may require large amounts of copyright-protected data for training purposes. However, the creator of the application may be able to obtain sufficient training materials from other copyright holders or create them themselves. It is feasible to operate in a product market, such as news stories, by creating content using traditional methods without the use of AC technologies or the

requirement for licenses. However, this is only applicable if the product market is not restricted to AC-generated content or AC-dependent services or apps.

Furthermore, it is atypical for a copyright holder to have the ability to eliminate any form of competition in the market for their product by denying licensing. Specifically, content and services based on alternative current (AC) are likely to compete with traditionally created material and services that transmit it. Even if AC-produced material is unavailable, competition may remain heated. When the AC developer targets a product market solely for AC-produced content or AC-based services or applications, such as automatically-generated content, competition may be eliminated. As market share rises, the dominant corporation is more likely to eliminate competitors. Even if other qualifications are completed, competition may be discontinued. Abuse may occur in another product market (e.g. AC-based services) if the IP holder is not dominant due to the danger of reducing competition. A preliminary abusive denial may be justified if the application violates or exploits training data, undermining creation incentives.

AC developers may receive licenses and materials from copyright holders with a strong position in the product market under EU antitrust laws, which might limit competition in the AC developer's market. This goes beyond copyright exclusions since antitrust legislation may allow a broader spectrum of AI system invention and use, which may not include text and data mining. Antitrust legislation may also cover technological and contractual access and use restrictions on any issue. Even if copyright holders limit access to the Text and Data Mining (TDM) exemption, antitrust laws may help. As said, these antitrust duties seldom apply to artificial creative projects due to the lack of copyright holders with market power and the potential to restrict competition in a relevant product market (Gaviria, 2021).

16.2 Limitations on the Creation or Utilization of AC Applications

EU antitrust can enable AC developers to access copyright-protected materials through means other than the restriction on unreasonable refusals to license. Specifically, antitrust measures can enhance their ability to obtain training materials by forbidding exploitative or constraining licensing terms, as elaborated about thereafter.

16.3 Injustice in Pricing or Conditions

A strong position in the intellectual property licensing market may be used to demand excessive licensing fees or impede AC development. When prices deviate considerably from the product's economic value or the pricing model exceeds the dominant enterprise's legal interests, abusive pricing occurs. If dominant copyright holders impose licensing prices that don't represent the value of licensed works in AC applications or account for use, they may be oppressive. If license rates incorporate data value rather than copyright, they may be exorbitant. Since data access and copyright licenses may have various values.

Abuse (unrelated to pricing) may occur if the conditions limit the opposing party's market function beyond the dominant firm's legitimate interest. Restricting AC development or use of current AC apps is unjust. Overprotecting copyright holders would impede licensees' flexibility to innovate new technologies and items (Li et al., 2020).

Importantly, unlike instances of refusing to grant licenses in an abusive manner, these forms of abuse do not necessitate a presence, control, or exclusion in the market for the final product. Consequently, instances of misconduct are more likely to occur in the realm of artificial innovation, given that a monopoly in the intellectual property market is enough to enable such behavior. For instance, it may be necessary to mandate copyright collecting societies or other entities that hold a dominant position in a licensing market to provide licenses to use artificial creativity applications. These licenses should be offered at fair and acceptable conditions, without imposing excessively high fees or unjustifiable restrictions on the growth of artificial creativity. Rights holders can still protect themselves with reasonable licensing conditions from the development and use of AC applications that threaten their interests and incentives since proportionally protecting them may preclude abuse or provide an objective justification (Stucke & Ezrachi, 2023).

16.4 Agreements Restricting AC Development or Use

Antitrust can further promote the development of alternative current (AC) by forbidding and nullifying contractual limitations on AC development or utilization. For example, this would facilitate the advancement of AC (artificial intelligence) development when the developer possesses specific resources (such as those accessible on the internet) but is unable to utilize them in AC development due to contractual limitations that prohibit their usage (such as terms of use agreements). Given that this ban encompasses agreements between all entities, not just those enforced by dominant copyright holders as described earlier, it applies to a wider range of entities than those previously considered.

.Agreements that limits AC development or usage may violate competition laws. Initially, licensing terms that disallow AC creation using licensed material might limit the licensee's R&D capabilities. Limitations like this are troublesome in technology transfer agreements. Such agreements between rivals restrict competition severely. However, agreements between non-competitors must be reviewed separately, regardless of whether the license includes limited research and development (Birchfield et al., 2022).

Copyright license agreements that limit AC development may impede competitiveness like R&D constraints. A license that prohibits AC development is not a research and development limitation. An exclusive license for non-commercial usage does not automatically restrict research and development (R&D) operations. It signifies the license doesn't allow R&D. AC application restrictions may also hinder product market competition, such as for content or services. Limits on AC-generated content in some locations may be passive territorial sales restrictions (Dwivedi et al., 2021).

Licensees are not subject to restrictions on the development and utilization of AC applications, provided that such restrictions hinder competition in the manner specified by antitrust laws. However, in the case where non-dominant right holders are unwilling to grant permission for the utilization of their works in AC development, they do possess the alternative of refusing to enter into licensing agreements about AC development. However, in most cases, dominant right holders have the option to do the same, barring exceptional circumstances as mentioned earlier, without being explicitly obligated to restrict AC development. Therefore, the application of these antitrust restrictions on agreements that restrict the development or utilization of AC would be limited to circumstances in which AC developers are already bound by a licensing agreement that would allow for AC development (absent a particular restriction) or have the capacity to enter into such an agreement (Dwivedi et al., 2021).

17. Comparative Analysis of Pakistan's Policy Recommendations about the Protection of Creators and Content Generated by Artificial Intelligence

A legal framework that handles ownership and protection of material created by artificial intelligence (AI) is required because of the increased prevalence of AI. According to the findings of comparative research with the European Union (EU), this article provides an analysis of the existing legal environment in Pakistan and comes up with some suggestions. There is no mention of artificial intelligence authorship in Pakistan's Copyright Ordinance 1962, which may indicate that ownership rights for material created by AI are not entirely apparent. Potential anti-competitive acts by dominant AI developers may not be sufficiently addressed by the Competition Act of 2010, which was passed in 2010.

Member states are permitted to recognize artificial intelligence inventions as works protected by copyright under the EU Copyright Directive (2019/790), but the details are left up to national legislation. Artificial intelligence (AI) developers that depend on dominant platforms may stand to profit from the Digital Markets Act (DMA), which intends to prohibit dominant platforms from limiting competition against them. To recognize the authorship of artificial intelligence, the Copyright Ordinance should be amended. The policymakers should think about possibilities such as recognizing artificial intelligence as a technology that has to be authored by a person to preserve copyright.

17.1 A Few Exceptions and Fair Use:

Create unambiguous fair use rules for contents that are created by artificial intelligence, which will enable

for its usage for study, criticism, and teaching without infringing on copyright agreements. In the interest of competition and antitrust, the Competition Act, 2010 should be strengthened to address the possibility of dominant AI developers engaging in unfair business activities. Take into consideration the possibility of regulating the terms and circumstances of AI development platforms to provide creators who use these tools with equitable access and competition. The integration of intellectual property issues for material created by artificial intelligence into a comprehensive national AI policy is the goal of the National AI Policy Integration. To monitor and handle developing legal concerns relating to artificial intelligence and content production, Pakistan needs to establish a specialized legal framework and enforcement mechanism.

17.2 Points to Consider:

- Achieve a balance between the necessity to protect creators and the need to stimulate creativity in the development of artificial intelligence.
- The legal framework should be modified so that it can fit the ever-changing nature of the capabilities of artificial intelligence.
- Develop a unified approach to artificial intelligence and copyright by working together with international organizations such as the World Intellectual Property Organization (WIPO).
- Through public awareness efforts, producers and developers should be educated about their rights and duties about material that is created by artificial intelligence.
- Spending money on research and development to investigate potential technological solutions for the management of rights and attribution of material created by artificial intelligence devices. Copyright Law should be modernized by amending the Copyright Ordinance to accommodate authorship of artificial intelligence. This might involve studying possibilities such as recognizing human-AI cooperation or providing sui generis rights under certain circumstances.
- To encourage transparency and attribution, it is necessary to mandate that material created by artificial intelligence (AI) be transparent, revealing both the function of the AI and the human input and providing explicit means for assigning authorship.
- Incorporate intellectual property concerns for contents created by artificial intelligence into a complete national AI policy, and establish a specialized organization to monitor and resolve emerging legal problems. This should be the goal of the national AI policy integration.

Pakistan can establish a legal environment that fosters innovation in artificial intelligence (AI) by putting these complete suggestions into action. This environment will also ensure that creators who use this technology in their work are treated fairly and protected. Pakistan can construct a more comprehensive legislative framework that protects content producers produced by artificial intelligence and supports a healthy environment for the development of artificial intelligence and creative expression if it adopts these proposals. The evolution of artificial intelligence technologies will need ongoing monitoring and adaption of the system.

18. Conclusion

The Policy signifies substantial progress made by Pakistan in its efforts to transition the nation into a knowledge-driven economy and promote responsible usage of artificial intelligence. It also sets out clear objectives to be accomplished within a certain timeframe. The utilization framework and evaluation process, in conjunction with the NAIF, will guarantee efficient policy implementation and ongoing improvement. The draft policy in Pakistan is praiseworthy for being the first of its type, precise, and complete. It can improve the country's legal framework with innovative laws. The Policy seeks to use the capabilities of AI while ensuring the protection of people's interests by tackling ethical dilemmas and promoting a reliable atmosphere.

There are possibilities and problems for Pakistan's legal system to deal with as the world of artificial intelligence-generated material continues to expand. Within the context of artificial intelligence

authorship, this comparison study with the European Union sheds light on possible deficiencies in Pakistan's existing copyright and antitrust laws, as well as potential anti-competitive behaviors by dominant AI developers. It is unclear who owns work that was created by artificial intelligence since Pakistan's Copyright Ordinance does not address the issue of authorship. This not only makes it difficult for creators who depend on AI tools to construct a sustainable ecosystem for the production of content driven by AI, but it also generates uncertainty for those creators.

Although it is still in the process of developing, the method taken by the EU provides useful insights. A framework that is adaptable is provided by acknowledging the possibility that works created by AI might be protected by copyright, but leaving the details up to country legislation. The Digital Markets Act of the European Union tackles the issue of possible dominance in the digital arena, which may be of value to Pakistani artificial intelligence developers that depend on platforms of this kind.

It is essential to strike a balance between protecting creators and encouraging innovation in the development of artificial intelligence. To do this, Pakistan may create a legislative framework that is both flexible and adaptive, guided by international cooperation and continued monitoring as artificial intelligence technology continues to improve. Putting these ideas into action would allow Pakistan to establish a legal climate that promotes the development of artificial intelligence in a responsible manner while also guaranteeing that creators who use this powerful technology are treated fairly and protected. A dynamic future awaits material that is created by artificial intelligence. To ensure a thriving and long-lasting environment in which artists and AI tools may coexist and thrive, Pakistan's legislative framework has to be updated to keep up with advancements in the field.

Funding

This article was not supported by any funding from public, commercial, or not-for-profit sectors.

Conflict of Interest/ Disclosures

The authors have disclosed that there are no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

References

Akhtar, P., Ghouri, A. M., Khan, H. U. R., Amin ul Haq, M., Awan, U., Zahoor, N., Khan, Z., & Ashraf, A. (2023). Detecting fake news and disinformation using artificial intelligence and machine learning to avoid supply chain disruptions. *Annals of Operations Research*, *327*(2), 633–657.

Alkhwaldi, A. F. (2024). Understanding the acceptance of business intelligence from healthcare professionals' perspective: an empirical study of healthcare organizations. *International Journal of Organizational Analysis*.

Atilla, S. (2024). Dealing with AI-generated works: lessons from the CDPA section 9 (3). *Journal of Intellectual Property Law and Practice*, *19*(1), 43–54.

Bang, J., & Park, G. (2023). *Uprising of ChatGPT and Ethical Problems*.

Bendel, O. (2023). Image synthesis from an ethical perspective. *AI & SOCIETY*, 1–10.
Birchfield, V. L., Roy, V., & Sreedhar, V. (2022). The EU's potential to lead in "ethical and secure" artificial intelligence: last, best hope? *Journal of Transatlantic Studies*, *20*(3), 299–327.

Bozkurt, A., Xiao, J., Lambert, S., Pazurek, A., Crompton, H., Koseoglu, S., Farrow, R., Bond, M., Nerantzi, C., & Honeychurch, S. (2023). Speculative futures on ChatGPT and generative artificial intelligence (AI): A collective reflection from the educational landscape. *Asian Journal of Distance Education*, *18*(1).

Budhwar, P., Chowdhury, S., Wood, G., Aguinis, H., Bamber, G. J., Beltran, J. R., Boselie, P., Lee Cooke, F., Decker, S., & DeNisi, A. (2023). Human resource management in the age of generative artificial intelligence: Perspectives and research directions on ChatGPT. *Human Resource Management Journal*, *33*(3), 606–659.

Chakraborty, C., Pal, S., Bhattacharya, M., Dash, S., & Lee, S.-S. (2023). Overview of Chatbots with special emphasis on artificial intelligence-enabled ChatGPT in medical science. *Frontiers in Artificial Intelligence*, *6*.

Chen, B., & Li, H. (2023). The Determination of Legal Liability in the Infringement of Online Ride-Hailing Service. *Journal of Education, Humanities and Social Sciences*, *11*, 102–107.
Chen, N. (2024). *AI, Pandemic and Healthcare*. CRC Press.

Chintalapati, S., & Pandey, S. K. (2022). Artificial intelligence in marketing: A systematic literature review. *International Journal of Market Research*, *64*(1), 38–68.

Dermawan, A. (2024). AI v copyright: how could public interest theory shift the discourse? *Journal of Intellectual Property Law and Practice*, *19*(1), 55–63.

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., & Eirug, A. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, *57*, 101994.

Gaffar, H., & Albarashdi, S. (2024). Copyright Protection for AI-Generated Works: Exploring Originality and Ownership in a Digital Landscape. *Asian Journal of International Law*, 1–24.

Gaviria, C. I. G. (2021). The role of artificial intelligence in pushing the boundaries of US regulation: A systematic review. *Santa Clara High Tech. LJ*, *38*, 123.

Halwachi, I. (2024). *The dilemma of authorship for AI-generated work in the EU and US. A comparative study of the notions of 'human input'and 'author's own intellectual creation'in the assessment of authorship for copyright protection of AI-generated work*.

Hartmann, E. A., & Shajek, A. (2023). New digital work and digital sovereignty at the workplace–an introduction. In *New Digital Work: Digital Sovereignty at the Workplace* (pp. 1–15). Springer.
Kambur, E., & Yildirim, T. (2023). From traditional to smart human resources management. *International Journal of Manpower*, *44*(3), 422–452.

Kathuria, S., & Tandon, U. (2023). Conceptualizing blockchain in tourism consumer experience: implications for tourism marketing. *Global Knowledge, Memory and Communication*.

Kazeeva, I. (2024). Sui Generis Intellectual Property Protection for Works Generated by AI Systems. In *Sui Generis Intellectual Property Protection: Comparison of EU and US Regulatory Approaches* (pp. 65–78). Springer.

Khan, A. A., Laghari, A. A., Li, P., Dootio, M. A., & Karim, S. (2023). The collaborative role of blockchain, artificial intelligence, and industrial internet of things in digitalization of small and medium-size enterprises. *Scientific Reports*, *13*(1), 1656.

Klobucnik, L. (2024). Intellectual Property Regulation of Artificial Intelligence: A Matter of Time or a Step Too Far? In *Developments in Intellectual Property Strategy: The Impact of Artificial Intelligence, Robotics and New Technologies* (pp. 91–112). Springer.

Li, K., Kim, D. J., Lang, K. R., Kauffman, R. J., & Naldi, M. (2020). How should we understand the digital economy in Asia? Critical assessment and research agenda. *Electronic Commerce Research and Applications*, *44*, 101004.

Mannuru, N. R., Shahriar, S., Teel, Z. A., Wang, T., Lund, B. D., Tijani, S., Pohboon, C. O., Agbaji, D., Alhassan, J., & Galley, J. (2023). Artificial intelligence in developing countries: The impact of generative artificial intelligence (AI) technologies for development. *Information Development*, 02666669231200628.

Opderbeck, D. W. (2024). Copyright in AI Training Data: A Human-Centered Approach. *Oklahoma Law Review*, *76*.

Rosak-Szyrocka, J., Żywiołek, J., & Shahbaz, M. (2023). *Quality Management, Value Creation, and the Digital Economy*. Taylor & Francis.

Shah, S., Hussain Madni, S. H., Hashim, S. Z. B. M., Ali, J., & Faheem, M. (2024). Factors influencing the adoption of industrial internet of things for the manufacturing and production small and medium enterprises in developing countries. *IET Collaborative Intelligent Manufacturing*, *6*(1), e12093.

Singh, S., Rajest, S. S., Hadoussa, S., Obaid, A. J., & Regin, R. (2023). *Data-Driven Intelligent Business Sustainability*. IGI Global.

Sohail, S. S., Farhat, F., Himeur, Y., Nadeem, M., Madsen, D. Ø., Singh, Y., Atalla, S., & Mansoor, W. (2023). The future of gpt: A taxonomy of existing chatgpt research, current challenges, and possible future directions. *Current Challenges, and Possible Future Directions (April 8, 2023)*.

Stucke, M. E., & Ezrachi, A. (2023). Innovation Misunderstood. *Available at SSRN 4547201*.
Tan, S. R., Jang, H., & Wood, J. (2024). *Economic Growth and Development in the Tropics*. Taylor & Francis.

Usama, M., Ullah, U., & Sajid, A. (2024). Cyber Attacks Against Intelligent Transportation Systems. In *Cyber Security for Next-Generation Computing Technologies* (pp. 190–230). CRC Press.

Vimalnath, P., Tietze, F., Eppinger, E., Jain, A., Gurtoo, A., & Elsen, M. (2023). Responsible intellectual property strategy for sustainability transition-An exploratory study. *World Patent Information*, *73*, 102195.

Von Ingersleben-Seip, N. (2023). Competition and cooperation in artificial intelligence standard setting: Explaining emergent patterns. *Review of Policy Research*.

Zhao, J., & Gómez Fariñas, B. (2023). Artificial intelligence and sustainable decisions. *European Business Organization Law Review*, *24*(1), 1–39.