Artificial Intelligence (AI) vis-à-vis Intellectual Property Rights (IPRs)

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- Diya Saraswat[1] & Arpit Agrawal[2]

Abstract

This paper provides a comprehensive examination of the intersection between Artificial Intelligence (AI) and Intellectual Property (IP) within the domains of art, music, entertainment, and technology. It delves into key subtopics, including the challenges of attribution in AI-generated works, the implications of ChatGPT for IP rights and copyright, the impact of AI on Trademarks, the potential of AI and Blockchain in IP protection, and the evolving IP policy landscape relating to art, music, entertainment, and technology. By addressing these subtopics, the report sheds light on the complex legal, ethical, and policy considerations arising from the integration of AI in the creative process, offering valuable insights for policymakers, practitioners, and stakeholders in navigating dynamic landscape of AI and IP in digital age.

Keywords: *AI, Copyright, Data, Technology, Blockchain*

Intellectual Property Rights

Intellectual Property Rights (IPR) are made to promote public openness and information exchange, protect the rights of artists and innovators, support economic progress, and safeguard cultural heritage. IPR laws encourage people and companies to spend money on innovation, research, and development by providing them exclusive rights to their intellectual property. A healthy ecosystem of invention, job creation, and economic advancement is produced as a result of these regulations, which guarantee that creators may control and profit from their creations. Additionally, IPR rules protect indigenous knowledge and traditional heritage while facilitating the diffusion of ideas and cultural expressions. IPR generally aims to establish a balance between fostering innovation, defending rights, and advancing society at large. Legislations that govern IPR in India are The Patents Act, 1970, The Copyright Act,

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1957, The Trademarks Act, 1999, The Designs Act, 2000, The Geographical Indications of Goods (Registration and Protection) Act and 1999, The Semiconductor Integrated Circuits Layout-Design Act, 2000.

Artificial Intelligence and Issues of Attribution

John McCarthy, in his 2004 paper defined AI as follows: *"It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable."*[3] The development of generative AI models and machine learning has inspired fresh discussions about the problems with attribution in AI-generated works. When it comes to tracing the origin of certain components and assigning rights to the resulting works, these models, which are capable of producing original content such as images, text, and music, present considerable difficulties. A major competition, Sony World Photography Awards, was just won by German photographer Boris Eldagsen. After the competition's winner was selected, the photographer revealed that the image he had submitted had been created by an AI system and declined to take the prize. This has sparked a public debate about whether AI should be acknowledged or referenced when a piece of work is produced utilising or generated by AI. There are a few intriguing topics to think about from the perspective of copyright law[4].

Creators have the right to be recognised as the creators of their works under the majority of copyright rules, including the Berne Convention. However, only human authors, not AI, are eligible for the right of attribution. Even though the Courts have not yet made a decision on whether AI-generated works can be accorded with copyright protection, it is apparent that an AI system cannot be considered to be

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[3] John McCarthy, 'What is Artificial Intelligence?' (*ResearchGate*, January 2004) <https://www.researchgate.net/publication/28762490_What_is_Artificial_Intelligence> accessed 10 Jan 2023.
[4] Rita Matulionyte, 'Should Ai attribute to Ai generated work?' (*Kluwer Copyright Blog*, May 15th 2023) <https://copyrightblog.kluweriplaw.com/2023/05/15/should-ai-be-attributed-as-an-author-of-ai-generated-works> accessed 20 May 2023.

the author of such works as it does not have a legal personality. As a result, AI systems are unable to possess rights that writers often possess, such as the right of attribution. There is no legal provision under the copyright law mandating attribution of authorial or co-authorial rights to AI, for AI-generated work.

The second concern is whether it is acceptable for human authors to claim authorship of an AI-generated piece. This will depend on whether or not the human contribution to the work meets the threshold of *"independent intellectual effort"* which is used in many jurisdictions to define originality (and authorship). A piece of work may not amount to original work by mere addition of a brief prompt by a human to a generative AI tool (such as, *"make a drawing of a horse with a hat"*). In this case, the person is unlikely to be given the title of an author. Some people could nevertheless be open to giving themselves credit as the authors of a piece of work, because human authorship is a need for copyright protection and they want the work to be safeguarded for commercial interests. Some might think that listing a human author will help the book sell more copies. Also, they would prefer for others to believe that they were the sole creators of the art, with little to no assistance from technology.

In some circumstances, however, identifying a person as the author of the image may be erroneous and may violate author attribution guidelines. False authorship attribution is prohibited by particular rules[5] in some copyright laws, such as those in Australia. The fact that, once again, only "authors" have such a privilege presents one of the challenges in implementing this regulation. Therefore, the misattribution could only be disputed by the work's legitimate author and inventor. It is doubtful whether any other party would have legal grounds to sue in the case of AI-generated content because an AI system would not have stand to allege misattribution. Regulations against unfair competition or consumer protection may be crucial in preventing the misattribution of AI-generated works in addition to copyright regulations. For instance, *"misleading and deceptive conduct"* is prohibited by Australian Consumer Law

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[5] Copyright Act 1968, S.195AC.

under Section 18. It may be argued that claiming human authorship for a piece of work that was entirely or partly generated by AI is misleading and dishonest. For customers who value the fact that product was produced by a human, this misattribution may become more and more crucial. It is uncertain, though, whether these clauses would be enforceable in all circumstances.

For example, S.18 only applies when conduct is done *"in trade or commerce",* which is not the case if AI-generated works are produced and shared in non-commercial contexts. Further, AI must be transparent in accordance with many ethical AI norms. For example, according to the EU Trustworthy AI Guidelines, "*Humans need to be aware that they are interacting with an AI system, and must be informed of the system's capabilities and limitations."*[6] Apart from this, *"there should be transparency and responsible disclosure so people can understand when they are being significantly impacted by AI, and can find out when an AI system is engaging with them,"* states one of the Australian AI Ethics principles[7]. These however remain a collection of unenforceable rules, and also fail to specify the scope of a transparency requirement and how it should be applied to AI-generated art.

Coming to attribution and the nature of generative AI, deep learning methods enable generative AI models, to examine enormous volumes of data to produce new material that replicates patterns and examples from the training data. Hence, it can be difficult to give credit to a particular source or person because of the nature of generative AI. Since the models combine numerous sources of inspiration, it might be challenging to identify the originals of particular components in the works that are produced.

These are certain challenges, since it becomes difficult to determine ownership and copyright for works produced by AI. The basis

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[6] European Commission, *Ethics guidelines for trustworthy AI* (EC, 8 April 2019) <https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai> accessed 10 Jan 2023.
[7] 'Australia's AI Ethic Principle' (*Australian Government, Department of Industry, Science and Resources*) <https://www.industry.gov.au/publications/australias-artificial-intelligence-ethics-framework/australias-ai-ethics-principles> accessed 10 Jan 2023.

of copyright law is often the idea of human authorship, which poses issues when artificial intelligence (AI) is the creator. AI as a creative entity may be difficult for existing legal systems to handle, and could result in disputes, uncertainty over ownership and copyright claims. When AI models create content that closely resemble pre-existing works or create derivative works, the attribution issue is made much more difficult.

Further, there are concerns about plagiarism and maintenance of ethical standards also. AI models have the potential to unintentionally produce content that violates the rights of already-existing intellectual property by copying protected works or making derivative works without required permission. It can be challenging to distinguish between intentional plagiarism and unintentional appropriation, which makes the attribution procedure much more challenging. When AI-generated content is shared online and has the potential to mislead and misinform consumers, this issue becomes very pertinent.

The issue of attribution in AI-generated works brings up serious issues of ownership, copyright, plagiarism, and ethical implications. To meet these obstacles, the generative AI industry needs creative solutions. The development of legislative frameworks and industry collaboration, along with technology interventions like watermarking, metadata, and blockchain, can pave the way for responsible and accountable attribution in the world of AI-generated works. Finding the ideal balance between the advantages of AI and the protection of intellectual property rights will become increasingly important as the field develops, if we are to support innovation and creativity in the digital era.

ChatGPT and IPR issues

"*Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks.*" - Elon Musk

In today's day and age, we are surrounded by Alexa, Siri or Cortana and looking at the advancements, companies like Tesla, Apple

and Uber are making innovations in the category of self-driving cars. It won't be surprising if within ten years we find them in the Indian automotive industry. In recent times, we have seen a surge of discussions around Artificial Intelligence, its future impact, its impact on the future economy and its legal implications. But it all started when on 30th November 2022, a private company based in Silicon Valley launched ChatGPT, an artificial intelligence tool which has been in the centre of every talk for past six months.

Ironically, none other than the ChatGPT would be the most fit to answer the question of what ChatGPT is. ChatGPT, based on the GPT-3.5 architecture, was released by OpenAI in the research preview phase on June 11, 2020. During this phase, selected users were given access to interact with the model and provide feedback to help improve its performance. The aim of the research preview was to gather insights and understand the strengths and limitations of the model in real-world usage scenarios. Since then, OpenAI has made updates and refinements to the model based on user feedback and insights gained during the research preview. Since the launch of ChatGPT, we have witnessed a race between different Silicon Valley companies like Google, Snapchat, Meta, Yahoo releasing their own AI model or including AI in their product. This astonishing growth of AI has also raised a question of its relations with the intellectual property rights in different legislations.

Artificial Intelligence and Copyright

The exclusive rights of the owner to perform or authorize the performance of certain acts (such as the reproduction, publishing, modification, and translation of a work, among others) concerning a work are referred to as *"Copyright"* under Section 14 of the Copyright Act of 1957. Furthermore, according to Section 17 of the Act, the creator of the work should be the original owner of the copyright; but, if the work is produced as part of a contract for consideration and at the employer's request, the employer is, in this case, the owner of the work.

In view of the judgment of the Hon'ble Supreme Court of India in *Eastern Book Company & Ors. v. D.B. Modak & Anr.[8]* which observed that *"to claim copyright in a compilation, the author must produce the material with exercise of his skill and judgment which may not be creativity, in the sense that it is novel or non- obvious, but at the same time it is not a product of merely labour and capital. The derivative work produced by the author must have some distinguishable features and flavour."* and therefore it is a requirement for any compilation or derivative work to show *skill* and *judgment*.

According to its charter, OpenAI's goal is to *"guarantee that artificial general intelligence (AGI) benefits all of humanity."* To clarify, AI systems have been divided into three categories: weak, strong, and superintelligence. Because they can only complete one task or identify a single solution, Siri and Alexa are instances of poor or limited AI. Strong AI, often referred to as artificial general intelligence (AGI), is an AI that possesses human-like intellect in terms of originality and creativity, as well as the capacity to learn from experience and develop new skills as it completes different tasks. It is a form of intelligence that would outperform even the brightest humans in every field. The Terms of Use (ToU) of OpenAI state that you own all Input *"as between the parties and to the extent permitted by applicable law."* All of OpenAI's rights, titles, and interests in and to the output are immediately assigned to the user, subject to compliance with the ToU. The chatbot's response is denoted as the output, while the user's query is termed as the input. The above-mentioned provision of the ToU will not be enforceable in the US or India as per their legal system.

It is simple to separate the copyright implications of ChatGPT into two groups: input and output. A human person gives the input as an inquiry, and if the conditions for copyrightability are met, the human being would be accorded authorship and ownership. This is also dependent upon the possible implications of the output, including whether or not it meets with copyright protection rules. Here, allocating output to the user appears to be absurd and ineffective on various levels, encompassing both technical and practical aspects. Let's evaluate the

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[8] *Eastern Book Company & Ors v. D.B. Modak & Anr., (2008) 1 SCC 1.*

technical issues from the standpoint of India. First off, assuming that ChatGPT immediately relinquishes ownership of whatever output it produces to OpenAI is not legally tenable. Is it more probable that the person who created the AI or the person who provided the input created the result that the AI produces?

The ToU requires us to establish whether OpenAI is the legitimate owner of ChatGPT's output by referring to Section 17 of the 1957 Copyright Act. Even so, Section 16 of the Act mandates that *"no person"* is entitled to copyright *"except as provided by law,"* Section 2(d)(vi) of the Act permits authorship to be given to the person *"who causes the work to be created"* in the case of computer-generated works, and Section 45, Application for Registration of Copyright, mandates the disclosure of name, nationality, and address. A single-line input cannot be utilized to determine whether a human contributed to the formation of the output under Section 2(d) (vi). Therefore, it would seem that no one is allowed to claim authorship (or co-authorship or ownership) of an AI-generated work under Indian law.

Then, how will the user prove that it has been legitimately given copyright for the Output once the aforementioned obstacle has been removed? The ToU violates the requirements for a valid assignment by missing details required by Section 19 of the Act, such as term, region, and the amount of any royalty or other payment owed to the author. It should preferably be included in the area for an artwork or piece to be published online. However, a work may be utilized even in the lack of a term and territory definition (but only to a limited degree).

The ToU recognizes that the Output *"may not be unique across users"* for questions of a similar character, in addition to the aforementioned technological difficulties. Think about a scenario where one person claims ownership of a certain output, while a second user claims ownership of the same output that he or she independently developed. Imagine that these types of claims were made routinely. Contrary to trademark law, copyright law does not apply to the idea of honest and ongoing use

because no two people can produce the same play or book. In contrast to regular copyright infringement litigation, when one side is often obviously at blame, the verdict would be unclear in these situations. This would imply that copyright protection cannot be applied to such Output.

The user is responsible for the input and output, "including for ensuring that it complies with all applicable laws" and the Terms of Uses, according to the ToU. What transpires when a third party's copyright is unintentionally violated even if the Work is not protected by copyright? When pressed, ChatGPT acknowledges that a sizable quantity of text data was used in its training. However, the Output was not created by ChatGPT, which is not acknowledged. It is unclear if consent has been obtained for such data. Because the usage could not even be regarded as fair dealing, this presents a difficult issue for the user who claims copyright over the Output.

How will AI Affect Trademark and to what Extent?

According to WIPO, *"A trademark is a sign capable of distinguishing the goods or services of one enterprise from those of other enterprises. Trademarks are protected by intellectual property rights."*[9] The amount of data related to brands, trademarks, and commercial use is enormous and is undoubtedly growing every day. Artificial intelligence tools will help us make sense of this data, create better databases, and improve search engines to maximize the benefits of understanding this data. As a result, it may alter how we determine whether two marks are confusingly similar or whether they are not. The number of applications and registrations is also continuing to rise, which is another trend in the area of trademark law. The number of applications and the number of registrations will likely increase regardless of whether the USPTO filing fees increase or not, as the number of new businesses opening in the U.S. and the value of brands and trademarks will both continue to rise. This is especially true if costs don't increase too much, and also attributable to the increasing presence of brands in front of us. For instance, when utilizing a new speaker or a Smartphone, or

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[9] WIPO 'What is Trademark?' <https://www.wipo.int/trademarks/en> accessed 10 Jan 2023.

watching something on TV or on a gadget, several brands are being brought before us.

It is astounding how much advertising, billboards, and other materials attempt to catch our attention and inform us about their goods and services by appealing to our eyes, hearing, or other senses. Each of us is affected by thousands of trademarks every single day that leave impressions on us; therefore, this tendency won't change and the number of registrations will keep growing. Thus, obtaining registration could change or become even more difficult, which is another linked development that needs to be addressed.

AI and Trademark Law – Significant Cases

There have been an increasing number of cases, both national and international, in this area due to artificial intelligence's rising influence in the technology world, which has also permeated trademark law. European courts or other courts from other jurisdictions frequently decide these cases. For instance, the Court did not find Google guilty in the well-known Google France SARL and *Google Inc. v. Louis Vuitton Malletier SA* case[10] because Google was not involved in the keyword advertisement issue[11]. A suggestion in this regard could be that Google could be asked in the form of a guideline to actually inform the users of paid references, in order to display transparency.

In the *L'Oreal SA v. eBay International AG* (C-324/09)[12] case there were two issues at stake viz., whether an online marketplace operator like eBay was responsible for illegal sales like the ones in question; and whether an online marketplace operator could be restrained from using a keyword that was identical to the trademark in advertising trademarked goods. The issue involved the sale of fake goods on online marketplaces;

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[10] *Google Franc SARL & Google Inc. v. Louis Vuitton Malletier SA* [2010] ECLI:EU:C:2010:159
[11] *Ibid.* para 121
[12] *L"Oreal SA v. eBay* [2011] ECLI:EU:C:2011:474

eBay was not held accountable because the marketplace had no part in the counterfeiting in question.

In *Coty Germany GmbH v. Amazon Services Europe Sàrl and Others*[13], where Amazon was found not liable on analogous grounds, a similar decision was made. The courts have seen AI infringement as a valid basis for liability notwithstanding the dearth of cases addressing the intersection of AI and Trademark Law. Perhaps the most notable case in this regard is *Cosmetic Warriors Ltd and another v. Amazon.co.uk Ltd and another*[14]. The dispute in this case arose when Amazon used the keyword 'Lush' from Google, through a bidding process. This in essence implies that the word 'Lush', when searched on google search engine, google redirected the users to the amazon website based on that keyword, and transferred the user to the platform. This was a solid case of infringement of trademark law because of the fact that when it was even searched on the search portal of the amazon website, the projected results from the website showed similar results, but the not the original 'Lush' brand products. It became an evident case of infringement as even though there was no sale of 'Lush' products on the Amazon website, rather it was showing products of a similar brand or a similar name. As a result, the court held Amazon accountable for trademark infringement in the given situation. The deputy judge ruled that Amazon's utilization of the 'Lush' mark as a keyword and in sponsored advertisements, despite not providing 'Lush' branded products for sale on the Amazon website, constituted trademark infringement. In particular, he also determined that when the average consumer saw the sponsored link advertisement which included the 'Lush' mark, they would expect to find 'Lush' products available on the Amazon site which was not the case here.

This situation is undoubtedly challenging because there have been cases where brands have been manipulated using E-commerce platforms powered by AI-based computational systems. It is hardly surprising that such issues will eventually come before courts in different countries

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[13] *Coty v. Amazon*, C-567/18. 16 5 *Cosmetic Warriors and Lush v. Amazon.co.uk*
[14] Amazon EU, [2014] EWHC 181 (Ch).

around the world. Until recently, courts have used the naïve "consumer" as a point of reference when interpreting the fundamental principles of trademark law. But as soon as artificial intelligence is developed, the "artificial consumer" will be taken into account. It has been established that as technology advances, courts, judicial interpretations, and a jurisdiction's legal doctrine adapt and evolve. For example, in India, Chief Justice DY Chandrachud recently observed that he wants to see a court which is completely paperless and the introduction of online transcripts of arguments in the courts[15].

AI and Patent

In other intellectual property realms, the patent world is discussing whether an AI can be listed as an *"inventor"* on a patent application. While not directly comparable, since the standards for *"authorship"* and *"inventorship"* are different, it is a notable step for understanding AI ownership rights, and as laws evolve with society, it isn't beyond imagination that Artificial General Intelligence may find its way as a *"legal person"* or may have laws specifically drafted for its regulation and ownership in the near future.

AI and Blockchain

According to IBM *"Block chain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. An asset can be tangible (a house, car, cash, and land) or intangible (intellectual property, patents, copyrights, branding). Virtually anything of value can be tracked and traded on a block chain network, reducing risk and cutting costs for all involved."[16]* There are different types of blockchain technologies such as private blockchain, public blockchain, permission blockchain networks,

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[15] Jyoti Prakash Dutta, 'My Chambers Are Almost Paperless, I Don't Receive Any Physical Files: CJI DY Chandrachud Pushes for Digitizing Court Records, E-Filing' (13 Dec 2022) <https://www.livelaw.in/top-stories/cji-dy-chandrachud-district-court-digitization-hubs-orissa-high-court-e-committee-216639> accessed 10 Jan 2023.
[16] IBM, 'What is Blockchain technology?' (*IBM*) <https://www.ibm.com/topics/blockchain> accessed 10 Jan 2023.

consortium blockchain. There are numerous benefits of using blockchain networks such as greater trust, more efficiency and greater security.

The global AI Market size and share revenue are anticipated to increase from $29.86 billion in 2020 to $299.64 billion in 2026, reflecting a 35.6 percent compound annual growth rate (CAGR), according to a recent Facts and Factors market research analysis. Similar to this, it is expected that the global block chain industry will grow at a CAGR of 67.3 percent, from $3 billion in 2020 to $39.7 billion in 2025.Approximately $4.4 billion is estimated to be spent by businesses on block chain in 2020, with global spending expected to reach $19 billion by 2024. Majority of corporate respondents said they planned to spend at least $1 million on distributed ledger technology.

According to Turing, one of the best illustrations of the reliability and security of block chain technology is Bitcoin. It is an innovative and promising technology. It lessens ambiguity, offers complete transparency, and guards against fraud. It is the most ideal technology because of the built-in security features.[17] Two of the most cutting-edge and inventive technologies to emerge in the previous 10 years are AI and blockchain technology, which have the ability to completely change the technological landscape. While blockchain technology is a distributed ledger that provides for safe, transparent, and tamper-proof applications, AI enables machines to assist humans and make judgements. By improving their security, transparency, and general efficiency, numerous businesses stand to benefit from the convergence of AI with blockchain technology.

OpenAI's ChatGPT, which was just released as ChatGPT 4, is an illustration of how AI is progressing. ChatGPT, a huge language model can produce human-like text-based responses to questions like assisting kids with their homework or helping researchers create their research materials. It represents a breakthrough in natural language processing and

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[17] Turing, 'The future of AI and blockchain technology & how it complements each other' (*Turning*)   <https://www.turing.com/kb/how-blockchain-and-ai-complement-each-other> accessed 10 Jan 2023.

has the potential to automate processes to enhance customer satisfaction. Together with blockchain, this is a potent combination. The key issue, though, is how these two technologies might be combined. One of the difficulties AI faces is trust and accountability, which has an impact on people's confidence in its results. AI must have understandable algorithms for people to be able to trust it, which would increase confidence in the precision of AI outputs.

By addressing the issue of explainable AI, blockchain's immutable digital record may make it easier to comprehend the conceptualization of AI and the source of the data it uses. This might increase confidence in the accuracy of the data used by AI and, consequently, in the suggestions it makes. Coming to Data Integrity and Security, users may see an audit trail of how their data is used by businesses and other centralised institutions thanks to the decentralised data storage offered by block chains. Blockchain enables access to data both inside and outside of an organisation, allowing for more actionable insights, and better control over data consumption, and model sharing, all of which can contribute to the growth of AI. This might lead to the development of a more reliable and open data market. By requiring less human involvement in multiparty business operations, combining AI with block chain may add value. Block chain technology has the potential to eliminate potentially pointless third parties from multiparty transactions, which, in principle, might speed up those transactions and improve their overall efficiency. While block chain protects the security of the transaction process, lowering transaction friction could enable people to own their data. According to Gartner: *"The business value provided by blockchain will reach $176 billion by 2025 and $3.1 trillion by 2030. AI will contribute $391 billion in business value by 2025"*.

The field of cyber security is one of the most important applications for blockchain and AI. The number of cyber security threats is rising alarmingly, and new attack routes are swiftly rendering the conventional ways of system security as outdated. Block chain technology can assure data security and integrity, while AI can be used to identify dangers and take appropriate action. AI and blockchain can be combined

to produce more effective and safe cyber security systems for individuals, businesses, and governments.

The subject of supply chain management is another area where the fusion of AI with blockchain technology is garnering traction. While AI may be used to analyse data and improve the supply chain, block chain technology can be utilised to build a transparent and secure supply chain. This can assist businesses in lowering expenses, increasing productivity, and guaranteeing the timely and high-quality delivery of their products. Block chain and AI are being used in the financial services sector to provide more effective and secure payment systems.

Decentralised marketplaces are also being built using block chain and AI. Decentralised markets enable direct transactions between buyers and sellers without the use of middlemen. Blockchain technology can assure the legitimacy and provenance of commodities, while AI can be used to optimise the market and offer tailored recommendations to purchasers. Also, healthcare sensitive data can be stored securely in some blockchain implementations, which can then be used by sophisticated AI models to analyse health data, spot patterns, and make precise diagnoses based on x-rays and records. Furthermore, cutting-edge encryption methods like homomorphic encryption might make it possible to execute computations on this data without compromising data privacy. By enabling the safe storage and exchange of patient records, data from medical research, and other sensitive information, AI and blockchain technology can improve data management, privacy, and security in the healthcare industry. This would make it easier for researchers in the fields of healthcare and lifespan to work together across geographical distances while maintaining the greatest levels of data security.

A blockchain-based computer programme called a *"smart contract"* consists of code that specifies particular conditions that, when satisfied, cause certain outcomes to occur. When it comes to utilising the power of artificial intelligence, the intrinsic self-executing nature of smart contracts offers some advantages. AI models integrated into smart contracts could

use specified conditions to carry out activities, such as identifying the need for extra inventory and placing order with a third-party supplier.

By digitising paper-based operations and enabling real-time tracking of items from manufacturing to delivery, the convergence of blockchain and AI may also increase transparency and lessen the likelihood of fraud. By properly balancing out each other's shortcomings, artificial intelligence and blockchain technology enable reciprocal benefits, technological improvements, and robust corporate support. The next step in the development of these two technologies to aid in corporate expansion would be to develop international standards for assessing the application of combined Blockchain and AI technology.

AI and IP Policy Relating to Art and Music

When it comes to intervention of AI in art, DALL-E, MidJourney AI and Stable diffusion are the major players in this complex evolving domain. Before going to the relations of IP policy in art, it is important to know how the AI makes this art. To produce aesthetically coherent and realistic pictures based on textual input, the model's underlying processes use cutting-edge deep learning approaches and probably include components of generative adversarial networks (GANs) or variational autoencoders (VAEs). The model is able to distinguish between written descriptions and related visual representations since it was trained on a sizable dataset of text-image pairs. DALL-E uses literary instructions or descriptions as the starting point for its artwork. These requests may come from users in the form of detailed instructions or ideas. The model then makes use of its training to produce a picture that matches the provided text prompt. DALL-E may produce everything from straightforward sceneries or items to intricate and fantastical creations.

So, the question is whether there is a chance that utilizing or creating artwork with DALL-E might violate someone's copyright? Through its carefully and skilfully crafted terms of use and contract, OpenAI cleverly sidesteps most copyright concerns while making

deceptive references to intellectual property ownership. Additionally, OpenAI is taking action to lessen possible difficulties with copyright, by: disqualifying picture uploads with recognized faces; rejecting generational cues that try to mimic the appearance of popular personalities, such as politicians and celebrities, or genuine images of real people; enhancing its filters to prevent users from producing offensive or prohibited content, such as violent, pornographic, or political content, and deleting relevant data from the software's training itself; putting into practice a novel method that is allegedly 12 times better at producing varied photographs of individuals in order to lessen prejudice; using both human and automatic monitors to keep an eye on the site and prevent abuse.

The combined effect of these procedures may aid in preventing right to publicity claims that might raise issues of intellectual property for owners of the rights by filtering out copyrighted images, trademarks, and logos. Additionally, OpenAI grants users complete commercial rights to exploit the DALL-E created graphics, including the *"right to reprint, sell, and merchandise"*. To be clear, this does not imply that OpenAI is giving up the right to market photographs produced by DALL-E users. The terms of service elaborate on this stating that *"OpenAI will not assert copyright over Content generated by the API for you or your end users"*. OpenAI is letting users know that they can use their DALL-E photographs for commercial purposes without worrying about getting sued or receiving a cease-and-desist letter from the creator of the images. This however does not exclude a third party from bringing legal action against someone who uses a DALL-E picture or sells an AI-generated piece of art.

Music

Tencent Music in China is said to have published over 1,000 songs with AI vocals that resemble human speech using the Lingyin Engine technology, some of which artificially imitate the voices of musicians who have since passed away. A song called "today" is said to have received more than 100 million streams. Year 2020 saw the filing of DMCA takedown requests by Jay-Z against anonymous YouTuber Vocal

Synthesis, who had produced deepfakes of Jay-Z singing a Billy Joel song and reading Hamlet by William Shakespeare. More recently, Depzman, a grime artist from Birmingham who unfortunately departed unexpectedly in 2013, utilized AI deepfake technology to make the postmortem single *"Life Cut Short"*.

AI will continue to have an impact on the music business and test current ownership laws. There will be worries that AI and machine learning may make human musicians and producers obsolete, increase music piracy, and further oversaturate music streaming. AI may merely play a bigger role in the collaborative process that goes into making music, rather than completely replacing humans. The trend suggests that AI will someday be more than just a *"tool"*, producing music with little to no human input. The regulation of AI in music industry, including its usage to impersonate artists or sample previous productions, is a recurrent problem that calls for advancements in regulating the technology. While some contend that new legislation is needed to address the unique effects of AI, others say that greater clarification is needed regarding how existing laws and licensing procedures should be applied. It is however certain that copyright protection will be significantly impacted by the growing usage of AI in the music industry.

Entertainment

In the entertainment sector, AI has become a significant force, transforming a number of processes such as content generation, distribution, and audience interaction. Content generation and curation are two of AI's important functions in the entertainment industry. AI algorithms may produce insights that guide decision-making in scriptwriting, music composition, video editing, and visual effects by evaluating large quantities of data, including viewer preferences and historical patterns. This makes it possible for content to be produced more quickly and effectively, enabling producers to satisfy the expectations of various audiences.

Personalized suggestions play a big part in AI. Machine learning techniques are used by AI-powered recommendation engines to assess user data and offer personalized content recommendations. AI algorithms may give highly relevant suggestions by comprehending viewers' preferences and behaviour patterns, increasing user engagement, and boosting the content discovery process. Increased audience happiness and retention are benefits of this level of personalization.

AI is essential for preventing piracy and protecting content. The increased use of digital platforms has made securing intellectual property a top priority for entertainment businesses. Online platforms may be scanned and watched by AI-based algorithms to spot illicit distribution and copyright violations. These systems can successfully identify and stop piracy by using machine learning algorithms, protecting the rights and income of content providers. AI also improves the audio and visual quality of entertainment material. Low-resolution movies can be up scaled, the sharpness of the images can be increased, noise can be eliminated, and the sound quality can be improved using AI algorithms. By greatly improving the viewing and hearing experiences, this technology makes sure that viewers can enjoy information in its finest potential form.

Emerging technologies like virtual reality (VR) and augmented reality (AR) are also impacted by AI. Because they make it possible for immersive narrative, accurate simulations, and spatial tracking, AI algorithms are essential to VR and AR experiences. These technologies depend on AI to evaluate user behaviors, dynamically change information, and build engaging virtual worlds. AI does this to improve the immersion and interaction of VR and AR, giving users engrossing experiences. Additionally, AI-driven analytics technologies offer insightful data on audience preferences, engagement, and activity. Using this information, entertainment firms may construct data-driven marketing plans, content plans, monetization strategies. Companies can optimize their investments, reduce risks, and enhance business outcomes by better knowing their audience. Last but not least, the usage of speech recognition and natural language processing enabled by AI has changed how people engage with

entertainment platforms. Chatbots and virtual assistants make voice-based conversations, information searches, and customer assistance easy. These conversational interfaces powered by AI offer individualized experiences that are convenient and increase user happiness.

AI is revolutionizing the entertainment sector. It is changing how entertainment is created, consumed, and enjoyed in a variety of ways, including content production and curation, tailored recommendations, content protection, improved experiences, audience analytics, and voice interactions. AI's influence will probably increase as it develops, opening us fascinating new opportunities in the entertainment industry.

Conclusion

The effective regulation of AI and IPR requires a multifaceted strategy that combines industry-driven, technological, and legal approaches. The difficulties with attribution in AI-generated works may be addressed with a number of solutions and interventions. AI-generated information might include watermarks or digital signatures to show legitimacy and traceability. Despite the blending of many sources, these processes aid in determining the origin of certain pieces and attribute ownership. Tracing elements back to their original source is made possible by the careful collection and preservation of precise metadata in the training and generating processes. Keeping track of the source of the work makes it easier to recognise contributions and sheds light on the creative process. Making use of the decentralised and unchangeable ledger provided by blockchain can improve attribution in works produced by AI.

Further, transparency and accountability can be achieved by keeping pertinent data such as ownership rights, training data, and contributions, on a blockchain. It is essential to create new legal frameworks and policies that handle attribution issues as AI-generated works continue to challenge conventional copyright and ownership paradigms. In order to develop effective rules and standards for attribution in AI-generated works, cooperation between legal experts, AI researchers, and industry stakeholders is required.