



Osmania University Journal of IPR [OUJIPR]

Vol.1 | Issue 1

July 2023

Unleashing Blockchain for Trademark Protection – An Analysis

Amisha Singh & Shivam Madhur

Pages: 114 – 131

Recommended Citation

Amisha Singh & Shivam Madhur, 'Unleashing Blockchain for Trademark Protection - An Analysis' (2023) 1(1) OUJIPR, 114 <<https://ouipr.in/oujipr/vol1/iss1/7>> accessed [date]

Available at: <https://ouipr.in/oujipr/vol1/iss1/7>

This Article is brought to you for free and open access by DPIIT IPR-Chair, Osmania University. It is published in the Osmania University Journal of IPR [OUJIPR] and copyright therein remains jointly with the Contributor and the OUJIPR.

For more information, please contact: editor.oujipr@ouipr.in

Unleashing Blockchain for Trademark Protection – An Analysis

- Amisha Singh¹ & Shivam Madhur²

Abstract

A trademark is a word, phrase, symbol, or design that is used to identify and distinguish the goods or services of one party from those of others. Trademarks are important because they help consumers to identify and choose the goods or services that they want. They also help businesses to build brand recognition and goodwill. The importance of trademark protection has increased in the digital age since the internet has made it easier for businesses to reach a global audience. However, it has also made it easier for businesses to infringe on each other's trademarks. Blockchain is an emerging technology that has the potential to revamp the protection of trademarks. Blockchain is a distributed ledger technology that can be used to record information securely and transparently. This makes it ideal for tracking trademark registrations and enforcing trademark rights through decentralization and increased accessibility. Overall, blockchain is a promising technology that has the potential to revolutionize the way that trademarks are protected through interactive legal tools like smart contracts and anti-counterfeiting measures. By using these technologies, businesses can more effectively protect their trademarks and ensure that they are able to fully benefit from their brand.

Keywords: Trademarks, Blockchain, Smart contracts, Infringements, Decentralization

Introduction

*“We have elected to put our money and faith in a mathematical framework that is free of politics and human error.”*³ This statement signifies the belief that people have developed over the course of time in Blockchain and exemplifies the extent to which blockchain has become relevant in the modern age. In spite of all the uncertainties which came onboard with blockchain technology, blockchain technology has now established itself as a well known and credible medium of sharing information, to the extent that nations are contemplating whether it could be utilized in high

¹ Student (B.A.LL.B.(Hons.), 3rd year), Chanakya National Law University, Patna; email: 2310@cnu.ac.in

² Student (B.A.LL.B.(Hons.), 2nd year), Chanakya National Law University, Patna; email: 2635@cnu.ac.in, shivammadhurkumar18@gmail.com

³ Nathaniel Popper and Peter Lattman, ‘A s Big Investors Emerge, Bitcoin Gets Ready for its Close-Up’ (CNBC, 12 April 2013) <www.cnbc.com/id/100635418> accessed 23 May 2023.

stake nations influencing events like digital voting systems in elections.⁴ For example, countries like Russia and Sierra Leone have already launched a pilot project in 2019 where they conducted a Blockchain-based voting system in their respective countries.⁵

There are numerous instances of the trustworthiness of Blockchain technology, the most prominent of which is crypto trading. The effective utilization of blockchain technology could only be because it provides instant, shared, and entirely transparent information stored on an immutable ledger, accessible solely by authorized network participants. Before moving on to understand the intricacies of Blockchain and its effectiveness in Trademark Protection, it is crucial to understand what exactly Blockchain Technology is.

Blockchain is a decentralized, unchangeable ledger that simplifies asset tracking and transaction recoding within the framework of corporate network. An asset could be both tangible (a house, car, money, or piece of land) and intangible (patents, copyrights, branding, and intellectual property). On a blockchain network, practically anything of value may be recorded and traded, leading to reduced risk and enhanced efficiency for all involved parties.⁶

Trademark on the other hand empowers and protect the entrepreneurial ambition of the firm and help the companies protect their individualities and uniqueness based on their graphical representation. Trademark registration has indeed become indispensable for any brand.⁷ A trademark is a symbol that can be used to separate the products or services of one company from those of other companies. Intellectual

⁴ Toshendra Kumar Sharma, 'Blockchain' (*Blockchain Council*, 15 October 2019) <<https://www.blockchain-council.org/blockchain/top-countries-that-conducted-elections-on-the-blockchain/>> accessed 23 May 2023.

⁵ *Ibid.*

⁶ Department of Commerce, National Institute of Standards and Technology (Internal Report, 8202 2018) ch.1 Introduction (NIST IR No. 8202, 2018) para 1.

⁷ Maurine L Knutsson, 'The Importance of a Trademark Registration in a Global Economy' (*Banner and Witcoff IP Update*, Winter 2015) <<https://bannerwitcoff.com/wp-content/uploads/2016/05/Knutsson.The-Importance-of-a-Trademark-Registration-in-a-Global-Economy.pdf>> accessed 23 May 2023.

property rights provide protection for trademarks. ⁸Therefore, considering the aforementioned aspect of the Trademark, its protection becomes crucial.

Blockchain Technology could be revolutionary if utilized perfectly in Trademark Protection Domain. This article proposes that amidst various ways of trademark protection, blockchain technology could be the most efficient way of trademark protection considering this technology bring along with it many benefits which will be discussed in detail. The article has been divided into 4 parts followed by the conclusion.

Blockchain Unveiled: Beacon of Trust and Immutability

The fundamental principles of blockchain technology can be elucidated by understanding its core components and mechanisms. Blockchain uses cryptography, decentralization, and immutability as its core principles to establish a highly secure foundational software system that is highly resistant to tampering. There is no single point of failure, and a single user cannot alter the transaction records. One key principle of blockchain is '*decentralization*'.

Decentralization

In contrast to the conventional centralized systems where a single authority controls the data, blockchain disperses the ledger across numerous nodes or computers. Each participant in the network holds a copy of the entire blockchain, ensuring that no single entity has control or can manipulate the data. Unlike, the traditional centralized system, where the entire organization runs the risk of disintegrating if any one authority is ever undermined, harmed, or corrupted. However, a system that is free from any corrupt power can continue to provide stronger security and independence.

⁸ Trademarks (WIPO) <<https://www.wipo.int/trademarks/en/>> accessed 23 May 2023.

“The biggest threat to privacy that we face is that the power of computing is doubling every 18 months. The human population is not doubling every 18 months but the ability for computers to keep track of us is” says Phil Zimmerman⁹, reminding us of Moore’s Law¹⁰. Aforementioned statement by Zimmerman indicates importance of cryptography, which is another principle of Blockchain.¹¹

A layer of trust is enabled and the necessity for a third party to confirm the transactions is removed thanks to the distributed ledger technology known as the blockchain. Distributed systems, cryptography, and other technologies are all combined in blockchain technology. Blockchain blocks are protected from manipulation using cryptographic hash algorithms to store data and transactions. Using the hash function, blocks are securely linked to one another. This results in a Blockchain, a distributed ledger that is kept across different network nodes. Each block includes transaction information, the preceding block’s hash, a date, etc. At most stages, it is challenging for an enemy to change the information that has been saved. Therefore, compared to a centralized system, Blockchain offers greater security. The blockchain system consists of a series of transaction which is secured by an encryption code and composed of the receiver, the transaction information, and the sender.

Immutability

Cryptography + Blockchain Hashing Process = Immutability

Another principle is ‘*immutability*’, which guarantees that once data is recorded on the blockchain, it cannot be altered or tampered with. Each new transaction is linked to the previous one through cryptographic

⁹ Phil Zimmerman is the inventor of Pretty Good Privacy (PGP), which is software that provides data communication privacy that uses RSA encryption over the internet. See ‘Blockchain: Key Principles’ <<https://nadezdarodriguez.com/history-of-blockchain/key-principles/>> accessed 26 May 2023.

¹⁰ See Gordon E. Moore, “Cramming More Components on to Integrated Circuits”, *Electronics* Vol.38 No.8, pp.114-117, April 19, 1965 <<https://archive.computerhistory.org/resources/access/text/2017/03/102770822-05-01-acc.pdf>> accessed 26 May 2023.

¹¹ ‘National Blockchain Strategy’ (Government of India, Ministry of Electronics and Information Technology, December 2021) <https://www.meity.gov.in/writereaddata/files/National_BCT_Strategy.pdf> accessed 26 May 2023.

hashes, forming a chain of blocks. Any attempt to modify a block would require altering all subsequent blocks, which is computationally infeasible due to the consensus mechanism employed in blockchain networks. This feature deters unnecessary modification to user data by the host company in case they think of manipulating user data to gain out of unfair means. The concept of immutability is also extended to the rules and even the functions of blockchain applications by parts of the blockchain community.¹² It is also noteworthy, that the principle of using blockchain tokens for investments, so-called “*initial token offerings*” (ICO), is a popular financing method for blockchain startups, which underlines the significance of clarifying the concept of immutability.

Data Protection

The integrity of the data in the blockchain is safeguarded by immutability. After being captured, data cannot be changed, removed, or transferred, guaranteeing the accuracy and security of the data. People and companies frequently think about using blockchains to store sensitive data. This means that trademarks stored via blockchain would be almost unbreachable and will remain protected from any sort of infringement and counterfeiting of trademarks.

Efficient Auditing

Benefits of immutability include effective auditing. Immutable data makes it simpler to track and audit transactions because any changes to a transaction are permanently documented. As a result, it decreases the likelihood of fraud and fosters greater transparency, which could further assist in trademark protection.

¹² Nadezda Chikurova, “Blockchain: Key Principles” (CUNY, 2022), <https://academicworks.cuny.edu/cgi/viewcontent.cgi?article=5753&context=gc_etds> accessed 26 May 2023.

Fresh Possibilities

Businesses have new opportunities to innovate thanks to immutability. For instance, businesses can utilize smart contracts, which they can directly insert into lines of code, to handle supply chains and real estate transactions as well as transactions between buyers and sellers.

Dispute Prevention

Due to the permanent recording of all transactions, immutability aids in the avoidance of disputes. Using blockchain technology, the source and integrity of the data can be verified. Real estate transactions and insurance claims can both benefit greatly from this feature apart from trademarks. With the use of meta-protocols like Omni, Open Assets, Blockstack, and Factor, this technique is made simpler. Projects like Counterparty and Drop Zone use the less common “TXO” encoding. Data and transactions executed across the network are stored in the ledger in a decentralized fashion over a peer-to-peer network. Transactions undergo validation and verification through consensus (consensus protocols) across nodes within the Blockchain network.

Reinventing Trademark Registration: From Centralization to Decentralized Eminence

The primary legislation governing trademarks in India is the Trade Marks Act, of 1999. This Act provides the legal framework for trademark registration, protection, and enforcement in the country. It establishes the Office of the Registrar of Trademarks, which is responsible for administering the registration process. To obtain trademark registration, applicants must comply with the Trade Marks Rules, 2017.¹³ These rules outline the procedural aspects of filing applications, examination, opposition, and registration. The rules also define the different classes of goods and services for which trademarks can be registered.

¹³ Controller General of Patents, Designs and Trademarks, “TRADE MARKS RULES, 2017” (2017) Intellectual Property India <https://ipindia.gov.in/writereaddata/Portal/News/312_1_TRADE_MARKS_RULES_2017__English.pdf> accessed 26 May 2023.

The Indian trademark registration system follows a first-to-file principle, where priority is given to the first applicant to file for registration. However, the system also recognizes prior use as a defense against infringement claims.¹⁴ The registration process involves filing an application with the Registrar, who examines it for compliance with legal requirements. If accepted, the trademark is published in the Trademarks Journal for opposition purposes. If no opposition is filed within the specified period, the trademark proceeds to registration.

Overall, the traditional centralized Indian trademark registration system provides comprehensive framework for protection of trademarks. It ensures that trademarks are adequately protected and helps in fostering culture of innovation and creativity in the country. Blockchain technology has emerged as a groundbreaking innovation with potential to transform various industries, and one area where it holds immense promise is in the realm of trademark registration. By utilizing decentralized ledgers, blockchain can revolutionize traditional trademark registration process, offering increased transparency, security, and efficiency.¹⁵

Decentralization is a key feature of blockchain technology, as it eliminates the need for a central authority or intermediary, such as a government agency, in the trademark registration process. This decentralized approach ensures that all trademark-related transactions are recorded on a distributed ledger that is accessible to all participants, thereby enhancing transparency and eliminating the risk of tampering or fraud. The utilization of blockchain in trademark registration also enhances security. The immutability of blockchain records ensures that once a trademark is registered on the blockchain, it cannot be altered or manipulated without consensus from the network participants. This

¹⁴ 'Trademark Manual of Practice and Procedure' (Government of India, Ministry of Commerce & Industries) <https://ipindia.gov.in/writereaddata/Portal/IPOGuidelinesManuals/1_32_1_tmr-draft-manual.pdf> accessed 26 May 2023.

¹⁵ Gupta, Sahil and Sinha, Shubham and Bhushan, Bharat, 'Emergence of Blockchain Technology: Fundamentals, Working and its Various Implementations Proceedings of the International Conference on Innovative Computing & Communications (ICICC)' (2020) SSRN <<https://ssrn.com/abstract=3569577> or <http://dx.doi.org/10.2139/ssrn.3569577>> accessed 26 May 2023.

eliminates concerns related to the authenticity and integrity of trademark registrations, providing a reliable and tamper-proof system.

Moreover, blockchain streamlines the trademark registration process, eliminating the need for lengthy paperwork and intermediaries. With blockchain, all relevant information, including trademark applications, registration certificates, and renewal documents, can be stored and accessed on the decentralized ledger. This reduces the administrative burden and delays associated with traditional registration processes, enabling faster and more efficient registration procedures.

Furthermore, blockchain enables the establishment of a global network of trademark registrars, allowing for seamless cross-border trademark registrations. By utilizing smart contracts and consensus mechanisms, blockchain facilitates trust and cooperation among different jurisdictions, simplifying the complexities associated with international trademark registrations.

Blockchain technology has the potential to revolutionize trademark registration by leveraging decentralized ledgers. The transparency, security, and efficiency offered by blockchain can address the existing challenges in the traditional registration process, paving the way for a more streamlined and trustworthy trademark ecosystem. It has emerged as a revolutionary solution that offers numerous benefits, particularly in terms of transparency, authenticity, and prevention of tampering. The utilization of blockchain technology in various sectors has the potential to transform traditional systems and establish trust in a decentralized manner.

One of the key advantages of blockchain is its ability to enhance transparency. By design, blockchain creates a distributed ledger that is accessible to all participants in a network. This ensures that every transaction and piece of data recorded on the blockchain is transparent and verifiable by all stakeholders.

Authenticity is another significant benefit offered by blockchain. Blockchain technology utilizes cryptographic techniques to ensure the integrity and authenticity of data. Each transaction recorded on the blockchain is secured through encryption, making it extremely difficult for malicious actors to tamper with or alter the information. This attribute of blockchain provides a high level of assurance that the data stored on the blockchain is accurate and has not been tampered with.

Furthermore, blockchain has proven to be an effective tool in preventing tampering. Blockchain's decentralized and immutable nature makes it highly resistant to unauthorized changes or modifications. Once a transaction is recorded on the blockchain, it becomes part of a permanent and unalterable record. This feature makes blockchain particularly valuable in areas where data integrity and security are critical such as trademark protection.

Blockchain technology offers a range of benefits in terms of transparency, authenticity, and prevention of tampering. Its ability to provide a transparent and verifiable ledger, ensure the authenticity of data, and prevent unauthorized modifications makes it a powerful tool for various industries. As blockchain continues to evolve and gain adoption, its transformative impact on trust and security is poised to reshape the way we conduct business and exchange information.¹⁶

Smart Contracts: Empowering Trademark Enforcement and Licensing

Smart contracts are self-executing contracts that are stored on a blockchain. They can be used to automate the execution of an agreement, such as transferring funds from one party to another. The code that makes up a smart contract is replicated across multiple nodes on the blockchain,

¹⁶ Ryo Takashi 'How can creative industries benefit from blockchain?' (*McKinsey & Company*, August 2017) <<https://www.mckinsey.com/~media/McKinsey/Industries/Technology%20Media%20and%20Telecommunications/Media%20and%20Entertainment/Our%20Insights/How%20can%20creative%20industries%20benefit%20from%20blockchain/How-can-creative-industries-benefit-from-blockchain.pdf>> accessed 26 May 2023.

which makes it secure, permanent, and immutable.¹⁷ When a new block is added to the blockchain, the code is executed. If the involved parties have specified that particular parameters have been fulfilled, the code will carry out the action prompted by those parameters. If no such transaction has been initiated, the code will not take any steps. They are currently best suited for two types of transactions:

- Ensuring the payment of funds upon certain triggering events. For example, a smart contract could be used to automatically release funds to a contractor once they have completed a project.
- Imposing financial penalties if certain objective conditions are not satisfied. For example, a smart contract could be used to automatically charge a late fee if a payment is not made on time.

Smart contracts can reduce the need for human intervention in the contracting process, which can save time and money. They can also help to reduce the risk of fraud and errors. They could be used to establish and enforce intellectual property (IP) agreements, such as licenses. For example, a smart contract could be used to automatically transfer payments to the IP owner when their work is used. The smart contract could also be used to track the use of the IP and ensure that it is not used in a way that violates the terms of the license.¹⁸

Smart contracts were first proposed by computer scientist and cryptographer Nick Szabo in the early 1990s. According to him, *“New institutions, and new ways to formalize the relationships that make up these institutions, are now made possible by the digital revolution. I call these new contracts ‘smart’, because they are far more functional than their inanimate paper-based ancestors. No use of artificial intelligence is implied. A smart contract is a set of*

¹⁷ ‘An Introduction to Smart Contracts and Their Potential and Inherent Limitations’ (2018) Harvard Law School Forum on Corporate Governance (2018) HLSFCG <<https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/>> accessed 26 May 2023.

¹⁸ Birgit Clark, ‘Blockchain and IP Law: A Match made in Crypto Heaven?’ (2018) WIPO Magazine 45 <https://www.wipo.int/wipo_magazine/en/2018/01/article_0005.html> accessed 26 May 2023.

*promises, specified in digital form, including protocols within which the parties perform on these promises.*¹⁹

The primary advantages of smart contracts, which are self-executing and indisputable, are trust-lessness and efficiency.²⁰ Trust-lessness²¹ is crucial because traditional contracts rely on the parties' performance and enforcement of terms, whereas smart contracts automatically execute only if the predetermined conditions in the code are met. This eliminates the need for enforcement concerns and ensures that the contract will not be executed if the specified conditions are not fulfilled. Consequently, non-performance issues and disagreements over execution are eliminated with smart contracts.

However, smart contracts are not a universal solution for guaranteeing compliance with agreement terms and have their own challenges. One problem arises from the unchangeable nature of smart contracts, as once the terms are encoded into a block, they cannot be modified. This lack of flexibility²² prevents parties from negotiating or altering the terms after the contract is created. Moreover, jurisdictional issues can also arise with smart contracts. Since blockchains are accessible globally, transactions may involve multiple regions and jurisdictions, each with its own interpretations of contract law and regulations regarding smart contracts and blockchains. Determining the applicable law and jurisdiction can become complex and may lead to complications in enforcing the contract. Blockchain technology has the potential of inculcating certain benefits with respect to trademark registration, profits to brand owners, security against counterfeiting, etc.

¹⁹ Nick Szabo, 'Smart Contracts: Building Blocks for Digital Markets' (University of Amsterdam) <https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOT_winterschool2006/szabo.best.vwh.net/smart_contracts_2.html> accessed 26 May, 2023.

²⁰ Obhan & Associates, 'Smart Contracts in India' (*Obhan & Associates*, 17 November 2021) <<https://www.obhanandassociates.com/blog/smart-contracts-in-india/>> accessed 26 May 2023.

²¹ Coalition of Automated Legal Application, 'How Blockchains can Support, Complement, or Supplement Intellectual Property' (Working Paper, May 2016) <https://www.intgovforum.org/en/filedepot_download/4307/529> accessed 26 May 2023.

²² *Ibid.*

Self-Executing Smart Contracts for Licensing of Trademark Rights

Licensing of trademarks can be of different types like franchising, merchandising, brand extensions, co-branding, ingredient branding, and standards certification, among others.²³ All these types of license agreements can be effectively implemented using smart contracts powered by blockchain technology. However, it is important to acknowledge that there is no universal standard for self-executing transactions (smart contracts) due to variations that can occur depending on the specific blockchain platform and its underlying principles of operation. Nevertheless, employing smart contracts based on decentralized distributed registries (databases) offers several advantages. These include reducing transaction costs, ensuring a high level of security and confidentiality, and achieving these benefits through decentralization and cryptographic protection.

Blockchain technologies can play a role in establishing and securing the rights of copyright holders for corresponding trademarks. This process often involves the tokenization of intellectual property, where digital tokens represent and embody the value of the assets. From an economic perspective, tokens hold significance and value as they can serve as accountable units within a specific system, functioning as digital assets. Additionally, tokens can act as a digital medium for facilitating the exchange of specific assets, such as property rights, intangible values, work or service results, and intellectual creations, including means of individualization. In such cases, these tokens can be referred to as “*secured tokens*”²⁴ since they record rights to other objects, or as “*certificate tokens*” that enable the mediation of ownership rights over various tangible and intangible assets. These tokens essentially serve as virtual representations

²³ WIPO, ‘Module 18: Trademark Licensing’ (n.d.) <https://www.wipo.int/export/sites/www/sme/en/documents/pdf/ip_panorama_12_learnin_g_points.pdf> accessed 26 May 2023.

²⁴ Odintsov, Stanislav & Mansour, M, ‘Trademarks’ License Agreement Based on a Smart Contract’ (*Atlantis Press*, 5 May 2020) <<https://www.atlantis-press.com/proceedings/mtde-20/125939870>> accessed 26 May 2023.

or symbols of property, allowing legally significant actions to be performed in relation to the corresponding assets.

The fundamental aspect of self-executing transactions utilizing blockchain technologies is the crucial initial agreement and certainty between the parties regarding the authenticity of their intentions concerning the essential terms of the contract. This is vital because in case of a dispute arising in the future, it would be challenging to establish and interpret the parties' recorded intentions within decentralized distributed registries for legal proceedings such as arbitration or mediation.

Conducive Enforcement Mechanisms against Infringements

IPR offices have the potential to establish “*smart IP registries*”²⁵ by leveraging distributed ledger technology. This approach would create an immutable record of events occurring throughout the lifespan of a registered IP rights, managed by accountable IP offices. It would serve as a reliable solution for gathering, preserving, and presenting evidence related to IP rights.

Implementing such smart registries would bring numerous benefits, including simplifying the audit process for IP rights. For instance, during mergers and acquisitions, it could reduce the required due diligence for IP transactions. Additionally, an opt-in system could address concerns about confidentiality raised by IP owners.²⁶ The information stored in the ledger would be valuable for brand owners, providing a point of reference for their rights and the extent to which those rights are being utilized in the market. Details about the usage of a trademark or data related to its initial use are crucial, and this technology could prove highly

²⁵ Clark, B., ‘Blockchain and IP Law: A Match made in Crypto Heaven?’ (2018) WIPO Magazine, Issue 1 <https://www.wipo.int/wipo_magazine/en/2018/01/article_0005.html> accessed 26 May 2023.

²⁶ Clark, B. and Burstall, R., ‘Crypto-Pie in the Sky? How Blockchain Technology is Impacting Intellectual Property Law’ (n.d.) [Online] <<https://assets.pubpub.org/j4q44mni/71573938669640.pdf>> accessed 26 May 2023.

valuable in disputes or procedures involving the recognition of well-known marks or defending against non-use revocation actions.²⁷

A blockchain-based trademark registry, could promptly alert the IP offices to the use of a trademark in trade or commerce. This would enable the use of a trademark in commerce with a verifiable time stamp, which is significant for establishing factors like first use, genuine usage, acquired distinctiveness, secondary meaning, and goodwill of a brand. Distributed ledger technologies (DLTs) could be employed to publish technologies as legal precedents, preventing others from unauthorized usage. The concept of “*smart contract performance*”²⁸ holds relevance in digital rights management and other IP operations, as specific blockchain systems can store, execute, and audit contractual codes. For example, digital information pertaining to IP rights could be stored securely, and smart contracts could facilitate negotiation and execution of IP agreements, such as licensing, enabling real-time payments to IP owners.

Micropayments and Royalty Payments

The utilization of blockchain technology enables the facilitation of micropayments, which was not efficiently possible before the advent of blockchains. Traditional financial networks incur high transaction costs that make it impractical to send small amounts of money. However, by implementing micropayments on blockchains, a “*tip jar*” model²⁹ for creative works can be established. For instance, by associating a Bitcoin address with a piece of work, individuals who come across the work can make micropayments to the address as a voluntary “*tip*” to the creator, without need for transaction fees paid to intermediary services. Moreover, with the integration of smart contracts, it becomes feasible to set up automated paywalls. This means that anyone wishing to access a specific

²⁷ Mathews, V.C. and Bhowmick, N., ‘Chaining Intellectual Property Rights to Blockchain’ (*BW Legal World*, 17 May 2022 <<https://bwlegalworld.businessworld.in/article/Chaining-Intellectual-Property-Rights-To-Blockchain/17-05-2022-428409/>> accessed 26 May 2023.

²⁸ Clark, B., ‘Blockchain and IP Law: A Match made in Crypto Heaven?’ (2018) WIPO Magazine, Issue 1 <https://www.wipo.int/wipo_magazine/en/2018/01/article_0005.html> accessed 26 May 2023.

²⁹ Coalition of Automated Legal Application (n 21).

work would need to make a micropayment to the author before gaining access to the content. The widespread adoption of micropayments and tipping systems for accessing and enjoying creative works has the potential to impact traditional collecting societies. These organizations are responsible for collecting royalties and negotiating royalty rates on behalf of their member rightsholders within compulsory licensing regimes. Collecting societies exist for various creative fields, such as authors, songwriters, composers, and more, and operate in almost every country.

Currently, a portion of the licensing fees paid by users supports the infrastructure of collecting societies. Creators receive royalties³⁰ based on the usage of their works, but precise tracking of usage has been prohibitively expensive in the past. To overcome this challenge, collecting societies have relied on sampling formulas to estimate total usage by monitoring a subset of users. However, this approach tends to favour well-known creators whose works are more likely to appear in the samples, neglecting lesser-known creators whose works may be missed by the formulas. The introduction of smart contracts and new content delivery mechanisms could address both the costly infrastructure of collecting societies and the imprecise sampling formulas. Internet-based content delivery allows for more accurate tracking of work usage, while smart contracts have the potential to automate royalty payments to artists. This could lead to increased rewards for creators and reduced costs for users, benefiting both parties involved.

Smart contracts offer the ability to guarantee fair remuneration for trademark owners and take prompt punitive actions against individuals or entities involved in trademark infringement. By utilizing smart contracts, trademark owners can establish predetermined terms and conditions within the contract that clearly outline the authorized usage of their trademarks. In the event of infringement, the smart contract can automatically initiate punitive measures, such as penalties or legal proceedings, without requiring manual intervention. This streamlined

³⁰ D. Mehta, S. Tanwar, U. Bodkhe, A. Shukla, and N. Kumar, 'Blockchain-based royalty contract transactions scheme for Industry 4.0 supply-chain management' (2021) 58 IPM.

enforcement process ensures swift consequences for those who violate trademark rights.

From Vigilance to Proactive Surveillance: Blockchain-Powered Anti-Counterfeiting Measures

Blockchain technology enhances traceability and transparency, delivering convenience and assurance to customers. Various industries, including manufacturing, education, finance, food, and healthcare, can benefit from leveraging blockchain. Developers have the flexibility to create application systems based on different blockchain platforms such as Bitcoin or Ethereum. The primary objective of implementing blockchain is to ensure the authenticity and traceability of items.

Manufacturers can securely store their product data within the blockchain, eliminating the possibility of data tampering. For example, each product can be assigned a unique ID, which can be accessed by anyone to retrieve relevant information about the product and its sales for verification purposes. To ensure the legitimacy of transactions, users are only able to make sales if the current owner's address and product ID match the records on the blockchain.³¹ This mechanism guarantees that consumers are purchasing products from their genuine previous owners rather than acquiring cloned or counterfeit items.

Blockchain technology offers a reliable tracking system that spans the entire supply chain³², from the procurement of raw materials to the delivery of finished products to end users. By implementing blockchain, companies can effectively combat counterfeiting by establishing proof of origin for their products. Companies utilize smart tags integrated with blockchain technology. These smart tags enable real-time tracking of

³¹ A. Anthony, M.C.L. Lee, R.R. Pearl, I.S. Edbert, and D. Suhartono, 'Developing an anti-counterfeit system using blockchain technology,' (2023) 216 PCS 86.

³² Shwetabh Raj, 'Use blockchain to protect against counterfeiting, European Commission's Intellectual Property Helpdesk' (*IP Helpdesk*, 6 September 2022) <https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/use-blockchain-protect-against-counterfeiting-2022-09-16_en> accessed 26 May 2023.

product movement throughout the supply chain, capturing crucial information such as the date of manufacture and other specific details assigned at different stages. This ensures transparency and accountability as the product progresses from one stage to another, decentralizing³³ the process. In essence, blockchain provides a secure and transparent method for companies to trace their products, validating their authenticity and preventing counterfeiting. Brands can establish the origin and integrity of their products throughout the entire supply chain.

One of the most substantial usages of blockchain for the registration of trademarks through blockchain has been displayed by the EU. In 2021 EU launched the first European IP register on blockchain in collaboration with participating offices.³⁴ The introduction of blockchain technology allows for the decentralized storage of data pertaining to registered IP rights, eliminating the reliance on a central data provider or server. By utilizing blockchain, an immutable and verifiable historical record of IP rights is created, encompassing the entire registry. This enables users to easily lodge priority claims, while also facilitating the exchange of information and requests among participating IP offices. Blockchain technology can be utilized by brands for logo distinctions so as to detect infringements and counterfeiting.³⁵ Efficiency and cost-effectiveness are a given when it comes to the usage of advanced technology but there lie some challenges like issues of privacy, security as well as the extent of usability and implementation in countries with poor digital infrastructure.³⁶ As the technology continues to develop, even more, innovative and ground-breaking applications for blockchain against

³³ Neo C.K. Yiu, 'Toward Blockchain-Enabled Supply Chain Anti-Counterfeiting and Traceability' (2021) DCS, UoO <<https://arxiv.org/pdf/2102.00459.pdf>> accessed 26 May 2023.

³⁴ Clifford Chance, 'EU IP Office Launches First Blockchain-Based IP Register & Anti-Counterfeiting Platform' (2022) <<https://www.cliffordchance.com/insights/resources/blogs/talking-tech/en/articles/2022/01/eu-ip-office-launches-first-blockchain-based-ip-register--anti-c.html>> accessed 26 May 2023.

³⁵ Smith, J., Doe, A., 'Combining Blockchain and Image Processing to Counterfeit Goods Detection' (2022) 5(2) IJRASET 100-115 <<https://www.ijraset.com/research-paper/combining-blockchain-and-image-processing-to-counterfeit-goods-detection>> accessed 26 May 2023.

³⁶ Zhonghua Zhang, Xifei Song, Lei Liu, Jie Yin, Yu Wang, Dapeng Lan, 'Recent Advances in Blockchain and Artificial Intelligence Integration: Feasibility Analysis, Research Issues, Applications, Challenges, and Future Work' (2021) SCN <<https://doi.org/10.1155/2021/9991535>> accessed 26 May 2023.

counterfeiting and trademark infringement may be introduced and implemented on a larger scale.

Conclusion

In conclusion, blockchain technology holds the potential to transform the landscape of IP guardianship, especially in the field of trademark protection. Blockchain technology enhances the efficiency and transparency of the intellectual property ecosystem. By providing a secure and auditable platform for storing and exchanging data related to IP rights, blockchain enables seamless collaboration among IP offices, allowing for streamlined priority claims, information sharing, and efficient decision-making processes. By providing a secure and transparent way to track the use of trademarks, blockchain can help to deter counterfeiting and other forms of IP infringement. Additionally, blockchain can be used to automate the process of collecting royalties and other forms of compensation for trademark owners. With the ongoing advancement in the field of technology, we can expect to see even more innovative and ground-breaking applications for blockchain in the field of IP protection.