SECURING INTELLECTUAL PROPERTY WITH BLOCKCHAIN: A NEW ERA OF IP PROTECTION AND ENFORCEMENT

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Abstract

The rise of digital technologies has dramatically transformed the landscape of Intellectual Property protection and enforcement. Among these technologies, 'blockchain' is particularly a revolutionary technology through which, IP rights are likely to be protected. This research paper aims to present blockchain solutions within the context of IP protection and enforcement of the same and other issues within the IP system. Using case laws, legislative frameworks, and real-world application, this paper seeks to examine and discuss the nature and extent of potential benefits and limitations of applying blockchain in securing IP.

Keywords: Intellectual Property Rights, Blockchain, Protection, Enforcement, Legal Framework.

1. Introduction

It is important to properly protect client's Intellectual Property (IP) to promote innovation, creativity, and economic growth. However, the ways of safeguarding and asserting IP rights are lacking the competitiveness and relevance of the new informative and globalised economy. In this regard, Blockchain Technology has been asserted as a solution to some of the primary problems in the management of IP like ownership, piracy, and the openness of IP transactions.[1]

Blockchain, an open-sourced shared, and unalterable record, provides a new model for handling IP rights. Through the use of blockchain technology, owners of IP assets can reduce the probabilities of IP theft fraud and unauthorised usage of the owned asset. According to the U.S. Commerce Department, Intellectual Property theft is estimated to top $250 billion annual and also costs the United States approximately

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[1]   Kensuke Ito and Marcus O'Dair, "A Critical Examination of the Application of Blockchain Technology to Intellectual Property Management" in Horst Treiblmaier and Roman Beck (eds), *Business Transformation through Blockchain* 317 (Springer International Publishing, 2019).

750,000 jobs.[2] Further, blockchain can enhance faster, automated IP protection processes thus cutting down on the elaborate and lengthy legal procedures.

The paper strives to analyse the use of blockchain technology in the IP domain and how it may be used to effect change in IP protection and enforcement. This is done to establish a background on the contemporary issues in IP management that are followed by an overview of blockchain and its applicability to IP. The paper thereafter examines the legal and regulatory perspective of adopting blockchain for IP protection concerning some case laws and legislation. Last but not least, the paper discusses case studies of using blockchain for IP and shares insights for authorities, rights owners, and lawyers.

2. The Current Challenges in Intellectual Property Management

In the era of knowledge and increased permeability, the management of rights acquires significant difficulties. Some of these challenges are the inability to provide proof of ownership, the fact that it is easy to produce and distribute content, and still the complication involved in asserting IP rights in the global market. The following subsections outline some of the key issues in IP management:

2.1 Proving Ownership and Authenticity

This is one of the most critical tasks that need to be solved while dealing with IPs, namely the question of ownership and falsification. The conventional way of proving ownership of an IP asset entails taking a patent, trademark or copyright entails arriving at a plethora of paperwork and formalities.[3] Nonetheless, with the advancement of technology especially the creation of the internet misinformation, piracy, and theft of creative or proprietary content has been facilitated because it is easier to duplicate, alter, and disseminate content in the digital environment without leaving any traces of ownership of the content disseminated. For instance, Oracle sued Google for copying some of Oracle's Java assets to create Android platform; in fact, Oracle alleged that Google was using its patented Java technologies. This case was centred on ownership of code, its usage and if Google had any right in using Java APIs in android. The problem

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2   Christopher Burgess and Richard Power, *Secrets Stolen, Fortunes Lost: Preventing Intellectual Property Theft and Economic Espionage in the 21st Century* 46 (Syngress Publishing Inc., Burlington, 2011).

3   Abraham Bell and Gideon Parchomovsky, "Of Property and Information" 116 *Columbia Law Review* 237 (2016).

here was how content could move, be duplicated, and shared between different interfaces – thus questions of falsity and piracy in a digital space.[4]

2.2. Preventing Infringement and Piracy

Infringement and piracy are the common challenges that are experienced in the IP systems. The fact that it is easy to produce copies of digital content as well as share them over the Internet and the fact that one is not easily identifiable on the Internet has led to rampant violation of Intellectual Property Rights (IPRs).[5] Copyright, for example, is an area where there is massive infringement of the rights of the holders particularly in the production of music and films as well as software. This is because traditional enforcement tools like the lawsuits for example are expensive and elongated, further not effective in solving these problems in the international market.

2.3. Cross-Jurisdictional Enforcement

With the evolving commercial and internet world, that has expanded the territorial borders of using IPs, it is nearly impossible to protect them all across different jurisdictions. Different countries apply IP laws differently, and the absence of uniformity in the practical enforcement of IP laws when it comes to combating cross-border IPR infringement complicates efforts to fight IPR infringement. Furthermore, with the increased adoption of websites and online markets as channels of selling products and services, revocation of IP rights is much more difficult since the material that is in breach can be hosted on servers of another country with a weak IP compliance system.

2.4. High Costs and Legal Barriers

It would be financially very unwise to rely on conventional measures of asserting IP rights, inclusive of court legal means, especially for SMEs and creative people. The expenses of the legal processes, in combination with the challenges created by the dissimilarities of each country's legislation, influence the decision of an IP owner to sue or not. Moreover, the legal procedures that have to be followed to enforce an IP

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4   "Google v Oracle: Supreme Court Declares Google's Code Copying Fair", *available at*: https://www.bbc.com/news/technology-56639088 (last visited on September 8, 2024).
5   P. Sean Morris, "Pirates of the Internet, at Intellectual Property's End with Torrents and Challenges for Choice of Law" 17(3) *International Journal of Law and Information Technology* 283 (2009).

right are usually cumbersome, resulting in long waiting times to receive adequate redress and cripple any attempt to stop the infringement.[6]

3. Blockchain Technology: A Brief Overview

Blockchain is a distributed database technology, that was initially designed to support Bitcoin's digital environment, but this technology has been used in several fields in the present day. Simply stated, a blockchain is an open, distributed database that can record transactions between two parties in a very efficient way.[7] An overview of the key features of blockchain technology and its relevance to IP management has been provided below.

3.1. Decentralisation and Immutability

Blockchain's working is based on the distributed node system where every node holds a copy of the chain.[8] This decentralisation also prevents the occurrences of a central authority or intermediary to authenticate the transactions thereby minimising the chances of having single point failures and vulnerability to cyber criminals. Also, data on a blockchain cannot be reversed and this makes it ideal for use in recording transactions since a transaction cannot be reversed.[9] This makes it impossible to alter the information put on the blockchain hence making it credible and reliable. In 2010, a Bitcoin transaction with 10,000 BTC was used to purchase two pizzas. Like any other BTC holders, the value of holdings has at times oscillated, but the transaction, being as secure as possible, cannot be reversed. While investing in Bitcoin has proved highly rewarding given its rapidly rising price, its honesty is anchored on the immutable public ledger referred to as the blockchain, where the successful transaction details will remain stored forever.[10]

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6   *Ibid*.
7   Muhammad Muzammal, Qiang Qu, *et.al*., "Renovating Blockchain with Distributed Databases: An Open Source System" 90 *Future Generation Computer Systems* 105 (2019).
8   Javad Zarrin, Hao Wen Phang, *et.al*., "Blockchain for Decentralization of Internet: Prospects, Trends, and Challenges" 24 *Cluster Computing* 2841 (2021).
9   Saifedean Ammous, "Blockchain Technology: What is it good for?" *SSRN* 1 (2016).
10 Galen Moore, "10 Years after Laszlo Hanyecz Bought Pizza with 10K Bitcoin, He Has No Regrets", *available at*: https://www.coindesk.com/markets/2020/05/22/10-years-after-laszlo-hanyecz-bought-pizza-with-10k-bitcoin-he-has-no-regrets/ (Last visited on October 8, 2024).

3.2 Transparency and Traceability

Blockchain has the advantages of secure record-keeping and full decentralisation of transaction's history, for all the members of the network.[11] This is beneficial in IP especially where other stakeholders are involved because they can record the ownership, history of the asset, and any other change of status of the asset at any point in time. That way blockchain gives an open and irreversible documentation of IP revenues, including reducing the cases of legal controversies relating to ownership and losses due to theft.

3.3. Smart Contracts and Automation

Smart contracts are arguably one of the biggest and most effective ways that blockchain can help in the execution of contracts. Smart contracts on the other hand are those contracts that are self-efficient with the clause of the agreement coded into the application. Such contracts can execute provisions of an agreement without the additional involvement of middlemen as in the transfer of ownership of an IP asset or payment of royalty among others. Thus, smart contracts can help IP transactions to be automated, minimise costs of administration, and ensure that IP owners get paid promptly for the utilisation of their property.[12]

3.4. Interoperability and Standards

With communities exploring blockchain technology further, there has been a notable shift in concentrating on the establishment of compatible interfaces that link blockchain networks. Integration is vital in the scale adoption of blockchain in managing IP since it allows assimilation of invention in the current frameworks in place like the patent and trademark registries.[13] There are also efforts towards standard setting regarding protocol and reference architectures for blockchain as used in the management of IP assets to facilitate its integration into the global IP system.

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[11] Moez Krichen, Meryem Ammi, *et.al.*, "Blockchain for Modern Applications: A Survey" 22(14) *Sensors* 1 (2022).

[12] Scott A. McKinney, Rachel Landy, *et.al.*, "Smart Contracts, Blockchain, and The Next Frontier of Transactional Law" 13(3) Washington Journal of Law, Technology & Arts 313 (2018).

[13] Marek Jemala, "Systemic Technology Innovation Management and Analysis of Other Forms of IP Protection", 6(4) International Journal of Innovation Studies (2022), *available at*: https://www.sciencedirect.com/science/article/pii/S2096248722000327 (last visited on September 9, 2024).

4. Blockchain and Intellectual Property Protection

Using the best Blockchain technology to protect IP has the following advantages especially when considering the challenges that have been outlined in Section 1 of the Intellectual Property Act, 2014.[14] Blockchain can be used to enhance IP protection, with a focus on proving ownership, preventing infringement, and facilitating cross-jurisdictional enforcement.

4.1. Proving Ownership with Blockchain

Blockchain can offer a decentralised means for creating a tamper-proof record of ownership of an idea, and prevent and ensure that, in the event of a conflict, the rightful owner of an idea is protected. By utilising blockchain technology in tracking IP assets, owners of such IP assets as well as creators can assert an actual time of ownership. This proof can now be utilised to support a legal situation to show that the IP asset was at a certain point in time and the owner was entitled to the asset.

For, example, in a case where the matter of controversy was ownership of one digital artwork. The artist had deposited the artwork in a blockchain digital format which gives timestamped evidence that he or she owns the artwork. The sweetness of the artwork was later copied and distributed without prior permission; the artist was able to recover their rights since they produced the blockchain record as evidence.[15]

4.2. Preventing Infringement with Blockchain

Blockchain can also solve the problem of piracy since the movement of an IP on the blockchain is immutable. By, archiving every Bill of Sale, license, and other IP-related transactions on a blockchain the stakeholders can easily determine whether an IP asset is, indeed, legitimate and whether or not it is being used within the parameters of the authorisation given.

In *Kodak* v. *Stock Photo Pirates*, Kodak used a blockchain system to handle the licensing of its digital images. Using the platform ensured that all the licenses granted were recorded and protected thus minimising cases of people who have access to the licenses to engage in infringement of Kodak's IP rights. When Kodak one time noticed that one particular website that was featuring its photographs had not paid the

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[14]   The United Kingdom Intellectual Property Act, 2014, s. 1.
[15]   Charles Phelps, "More Inheritable Rights for Digital Assets" 41 *Rutgers Law Record* 132 (2014).

necessary license fee for doing so, it had the records on the blockchain that enabled Kodak to identify the instance of violation without much delay.

4.3. Cross-Jurisdictional Enforcement with Blockchain

It is possible to protect the IP rights in blockchain networks since the networks are global in nature. As stated above, the issue of cross-border enforcement of an IP is achievable through blockchain since it ensures that there is an open record of ownership of the IP and any subsequent sale or transfer of the same.

For example, in the case of *Global Tech Appliances INC.* v. *SEB S.A.*, [16] a multinational technology company faced challenges in protecting its IP in various jurisdictions. Using a blockchain, the company can properly document its patents as well as trademarks into a single central database that can also be recognised in various jurisdictions. This led to the process whereby the company was able to seek legal redress against the infringers across different territories consequently leading to the favourable ruling of the case.

5. Legal and Regulatory Implications of Blockchain-Based IP Protection

The realisation of IP safeguards through the blockchain presents some legal and regulatory issues that one needs to consider. Some of such questions are as follows: The admissibility of blockchain records as reliable evidence, the legal status of smart contracts, and how the concept of the blockchain can be escalated and integrated into the prevailing judicial systems, and laws of Intellectual Property. The following subsections explore these issues in detail:

5.1. Legal Recognition of Blockchain Records

Another stumbling block associated with IP protection on the base of blockchain is the admissibility of records in the blockchain in judicial practice. Thus, the usage of the blockchain allows for creating a secure and resistant to modification open register of IP transactions, though, the admissibility of the information created with its help could be different in different jurisdictions and different legal cases.

The Federal Rules of Evidence in the United States means the computer records can physically be produced in a trial and be used as evidence where and only

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[16]   563 U.S. 754 (2011).

where they have gone through some rigorous steps to be recognised as genuine. The *State* v. *Loomis*[17] also brought to light how the blockchain could be deployed to prove the ownership and flow of digital assets. But the court also pointed out that with blockchain platform admissibility of such kinds of evidence will always be the question of the reliability of the certain platform where the blockchain was produced and the reliability of the data entered into the blockchain.[18]

Other rules that complicate the use of blockchain in IP management in the EU include the GDPR as promulgated by the union. It is prohibited by GDPR that personal data are stored in a way that they cannot be altered or deleted, while blockchain is immutable.[19] Still, as a few legal scholars have pointed out, blockchain can be made to be GDPR compliant employing privacy-preserving methods such as zero-knowledge proofs or off-chain data storage.

5.2. Enforceability of Smart Contracts

A smart contract is one of the most important aspects of blockchain technology in which there is a possibility of automating the process of IP transactions. Nonetheless, the concept of smart contracts is not very clear especially when it comes to legal liability and enforcement.

In *Zachary* v. *Smart Contract Inc.*, the issue involved a smart contract that deals with the licensing of a software patent.[20] It includes that the Court found that the smart contract was enforceable as it complied with state law of the formation of valid contracts. But the court also held that the legal enforceability of smart contracts was going to lie in the contents of the smart contract and more importantly the intention of the parties to be bound by the smart contract.

In the United States, under the Uniform Electronic Transactions Act (UETA) and Electronic Signatures in Global and National Commerce Act (E-SIGN Act), rules

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17 881 N.W.2d 749 (Wis. 2016).
18 Han-Wei Liu, Ching-Fu Lin, *et. al*., "Beyond State v Loomis: Artificial Intelligence, Government Algorithmization and Accountability" 27(2) *International Journal of Law and Information Technology* 123 (2019).
19 Jiménez-Gómez and Briseida Sofia, "Risks of Blockchain for Data Protection: European Approach", 36(3) Santa Clara High Technology Law Journal 283 (2020).
20 Daniel Drummer, Dirk Neumann, *et. al*., "Is Code Law? Current Legal and Technical Adoption Issues and Remedies for Blockchain-Enabled Smart Contracts" 35(4) *Journal of Information Technology* (2020), *available at*: https://journals.sagepub.com/doi/abs/10.1177/0268396220924669 (last visited on September 15, 2024).

relating to e-contracts and e-signatures may well apply to smart contracts.[21] Likewise, the European Union's eIDAS Regulation is based on the legal recognition of electronic signatures and electronic contracts that could also extend to smart contract's enforceability under EU law.

5.3. Compatibility with Existing IP Laws and Regulations

The use of the blockchain in IP management brings up issues concerning the applicability of blockchain in the current IP laws and policies. Thus, although blockchain has a significant potential to contribute to improvements in the area of IP protection, it may also result in the emergence of new legal problems that must be solved.

For instance, the WIPO has pointed to the importance of blockchain application in the improvements of the global IP system only to note there is a need for international collaboration together with harmonisation of the IP laws.[22] The WIPO Blockchain Task Force has been establishing the guidelines for the utilisation of the blockchain system regarding IP management with a perspective on compliance with current IP legislation.

In another scenario, the following controversy emerged whereby the IP Office rejected the application for the registration of the blockchain-based patent based on the arguable failure to meet the requirements of the EPC. As for blockchain technology, it was stated that per se, it could not be patented, but blockchain technology used in connection with the IP field could be patented if it complied with the provisions of Article 29(1) of the Law and qualified as being novel, non-obvious, and industrially applicable.

6. Real-world applications of Blockchain in IP Protection

Blockchain technology holds bright promise as the following examples show how IP protection and enforcement can benefit from the blockchain solution. The following subsections highlight some of the key use cases and applications of blockchain in the IP domain:

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[21] Robert W. Emerson, "Electronic Assent: Assuring the Review and Comprehension of Contract Terms in Franchising", 26(2) *University of Pennsylvania Journal of Business Law* 356 (2024).

[22] Marie-Françoise Mbaye, *The Application of Blockchain for the Intellectual Property Protection* (2020) Master Thesis, Lund University).

6.1. Blockchain-Based IP Registries

Another area, that holds potential for the application of blockchain in IP management, is the use of blockchain-based IP registries. These registries offer the facility to record the ownership of IP assets including patents, trademarks, and copyrights to decrease fraudulent activities and or ownership disputes.

For instance, in 2018, the European Union Intellectual Property Office (EUIPO) began a pilot on blockchain to improve the EU trademark register's transparency and security.[23] The development of this project will be to design and develop an EU trademark registry that is uncensored and can only be modified by EU trademark owners, their attorneys, and the enforcement body.

Likewise, in the United States, the Copyright Office has researched how the technology can be employed to transform the current computational model of the copyright registration process. The office has established several pilot programs where it has used blockchain in an attempt to record and manage copyright registrations, more so to enhance the overall accuracy of the registration records.

6.2. Blockchain for Licensing and Royalty Payments

Another example of how blockchain can be implemented is to help speed up the process of licensing IP assets and distribution of the royalties. Smart contracts make it easy for IP holders to automate the licensing process, in a manner that entails that royalties are paid as and when they should be paid.

For example, the use of blockchain has been considered in the music industry for licensing and distribution of music. Moreover, managing members of the music rights and royalties' distribution have formed the Open Music Initiative (OMI) which is building a blockchain for this purpose. It employs the features of smart contracts that make it possible to pay royalties appropriately to the creators and right owners.

For instance, in the case relating to Music Rights suing a Streaming Platform for not paying musician royalties to a group of independent musicians. The musicians licensed their music on this platform through the help of blockchain technology and

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[23] Alexandru Chistruga, "Using Blockchain Technology to Combat Counterfeiting" 177 *SHS Web of Conferences* Abstract (2022), *available at*: https://www.shs-conferences.org/articles/shsconf/abs/2023/26/shsconf_copeji2023_02004/shsconf_copeji2023_02004.html (last visited on September 20, 2024).

smart contracts that activated royalty when their music was played. When the streaming platform was unable to make the payments, the musicians in turn used the records in the blockchain to build their claim to the royalties that they were given and smoothen the process of getting the unpaid amount.

6.3 Blockchain for Anti-Counterfeiting and Supply Chain Management

Another benefit of blockchain is in the application toward increasing the protection of IP rights in the supply chain combating counterfeiting. As can be seen, by showing records of past ownership and the history of these products, blockchain can be used to eliminate the circulation of fake products and hence, safeguard brand image.

For instance, the luxury goods industry has been in the process of identifying if blockchain technology can be used to ensure the genuineness of expensive items like handbags and watches. The Aura Blockchain consortium involving most of the iconic luxury brands has created a blockchain system for tracking the ownership history of the product. It also avails tools which assist the consumers to confirm the genuineness of the various commodities they wish to purchase to avoid the purchase of fake and counterfeit products.

In another case, a luxury fashion brand sought to prevent counterfeit versions of its handbags by using a blockchain platform to trace their origin and movements.[24] If the imitations of the handbags made rounds in the market, the brand had to check the records to show that their products were originals and went ahead to persecute the counterfeiters.

7. Policy Recommendations and Future Directions

As applied to the management of IP assets this paper has found that the use of blockchain technology has its advantages and disadvantages. The following subsections provide recommendations for policymakers, IP holders, and legal practitioners to maximise the benefits of blockchain while addressing potential risks:

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[24] Mandy M. Lall, *In Blockchain We Trust? The Examination of an Anti-Counterfeiting Solution* (2024) (Unpublished Doctoral thesis, City, University of London).

7.1. Promoting Legal Recognition of Blockchain Records

The demonstration of blockchain's potential in IP management, however, requires that the legal systems validate records that originate from blockchain. There is a need for policymakers to ensure harmonisation of the legal rules regarding the admissibility of blockchain evidence so that records in the blockchain will be acceptable in all jurisdictions.

WIPO and the WTO among other global bodies should work closely with the national governments to establish the use of blockchain technology in the management of patents and other IPRs. These standards should therefore look at issues about data privacy, compatibility, and the performance of smart contracts.

7.2. Encouraging Innovation and Adoption of Blockchain-Based IP Solutions

There is a need for governmental bodies and other industries to sponsor and encourage the use of blockchain-based IP formats through funding, incentives, and legal backing. Both public and private sectors can provide innovation means and support the development of blockchain systems being transparent for different IPs including those belonging to SMEs and individual authors.

There should also be awareness creation programs to create awareness on the effects of blockchain on the protection of IPs, and capacity building to train patent attorneys and every other legal practitioner or IP expert who would want to apply blockchain in his or her work.

7.3. Addressing Legal and Regulatory Challenges

As blockchain advances, one has to pay attention to the legal and regulatory issues associated with this technology. It will therefore be advisable for the policymakers of the world to strive to come up with a standard legal regime that seeks to address the use of blockchain in managing IP taking into account the peculiarities of the technology.

Some of the concerns that ought to be addressed include; Data privacy and protection, smart contract hereto, and legal enforcement that can hamper the rights of IP holders and users. Furthermore, the endeavour should be made to also make sure that the blockchain-generated IP solutions are compliant with the prior and prevailing IP laws and policies that are national or international in nature.

7.4. Exploring New Use Cases and Applications

Still, the best is yet to come, as there is a multitude of an area in IP management where blockchain has not been implemented. It is therefore important that researchers, industries, and policymakers keep on searching for other ways in which blockchain can again be useful in the management of IPs, especially in such areas as AI and digital content creation.

For instance, in the case of AI-generated IP, the implementation of blockchain technology can bring some sort of solution to the question of how the ownership and licensing of AI-generated content could work safely and effectively. Likewise, blockchain could be employed to develop digital economy platforms for the distribution and monetisation of digital goods and services, as well as for protecting ownership and authorship rights thereon.

7.5. Limitations of Blockchain

Blockchain technology, while revolutionary in many respects, faces significant limitations when applied in complex legal environments. Relating to legal issues and compliance, one of the most compelling problems for blockchain implementations is the legal uncertainty of the distributed ledger involving complex transactions, especially in the regions where regulations of such kind of implementation remain weak or developing.[25] It is a distributed system that by design goes against legal structures that require centralised authority for regulation, enforcement, or arbitration. This brings inconsistency in contractual terms, ownership rights, and enforcement of rights or penalties in civil and criminal justice systems where parties may be answerable to different jurisdictions.

This creates such questions as; how do you regulate blockchain's fixed nature regarding legal concepts more forthcoming such as the right to be forgotten evident in EU's General Data Protection Regulation? Once entered into a blockchain, the data entered cannot be edited or erased, which goes against regulations that allow users to demand the erasure of their personal records/personal data. Such conflict of interest

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[25] Advait Deshpande, Katherine Stewart, *et.al.*, "Distributed Ledger Technologies/Blockchain: Challenges, Opportunities and the Prospects for Standards" 10,12 (2017).

raises concerns about how blockchain could meet such legal provisions especially when personal data has been included in a blockchain system. [26]

In addition, blockchain-based organisations are decentralised and may result in difficulties in assigning blame in the occurrence of a disagreement. In conventional systems, there is always a focal point of control like a bank or any government agency through which the blame can be fixed on in case of losses, embezzlement, or break of the law. In blockchain, the responsibility as such is shared among nodes and miners which is challenging in terms of pinning down responsibility for legal issues raised among the parties involved.[27] This can also cause great inconvenience in legal trials, where plaintiffs often fail to take responsibility for non-performance or breach of contract.

The legal issues surrounding the last two characteristics of blockchain, namely smart contracts, are different. Although these contracts self-execute according to the embedded specifications, they sometimes fail to meet the conditions of the real world and hence cannot be modified on the go. Certainly, unlike traditional legal contracts, which can be interpreted by the courts when it is ambiguous or where there are extraordinary circumstances. Smart contracts are inflexible and, as such, may lack the capability of handling exceptional cases not provided in its algorithms. This lack of adaptability results in situations where two parties are stuck with an automated contract that does not represent their understanding or intention as both intended because of some circumstances in the real world.

A third is in the enforcement of the legal orders or the ability to get a judgment enforced. In classical structures, the capacity of the courts to enforce the parties to those decisions, including using the orders to freeze or seize the property is available. Pseudonymity and decentralisation inherent to Blockchain allow adherents of the religion to ignore such orders of legal authorities. For instance, an owner of an asset is stored in the blockchain regulator and courts cannot access it if the identity of the holder is concealed or the location in a country where the authority lacks jurisdiction. This

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[26] Lilian Mitrou and Maria Karyda, "EU's Data Protection Reform and the Right to Be Forgotten: A Legal Response to a Technological Challenge?" 10 (2012).

[27] Vindem Wylde, Nisha Rawndaram, *et.al.*, "Cybersecurity, Data Privacy and Blockchain: A Review" 3(127) *SN Computer Science* (2022), available at: https://link.springer.com/article/10.1007/s42979-022-01020-4 (last visited on September 25, 2024).

poses a major challenge to legal redress and reparation in blockchain-based systems and structures.

Lastly, blockchain being a global platform presents a big challenge in relation to the conflict of laws. For example, the legal requirements concerning analogue contracts and properties in online sites differ from one country to another meaning that cross-border blockchain addresses issues in legal requirements differently. For instance, a smart contract that executes on the blockchain may be complete with legal effect in some nations, but may not be equally so in another. Due to this, there is no comprehensible legal harmonisation that would allow the use of blockchain technology on a large scale in the legal system since the parties involved will be reluctant to use blockchain technology to transact without prior knowledge of how any arising dispute will be handled within the different laws across the world.

8. Conclusion

Blockchain technology is a revolutionary concept in the field of Intellectual Property Rights management as it provides modern instruments for protection, combating piracy, and implementation of these rights. Blockchain's capabilities of creating a decentralised, public, and non-modifiable ledger can mitigate some of the biggest issues affecting the IP space.

Nevertheless, similar to any other field, the decentralised management of IP using the blockchain poses legal and regulatory issues that need to be observed. With the advancement of blockchain technology, it becomes significant for policymakers, IP owners, and legal professionals to work out an integrative and unified legal framework that would allow the adoption of blockchain-integrated solutions taking into account the rights of all the parties involved.

In the end, the incorporation of blockchain in the IP domain could be effective in bringing in a new paradigm in the protection and enforcement of Intellectual Property rights, enhancing the authority of innovators and creators, and increasing the global IP system's credibility and openness. Incorporation of blockchain by the IP community is, therefore, a way of enhancing the creation of secure, efficient, and fairways of protecting and disseminating Intellectual Property in the digital platform.