Journal of Intellectual Property Studies Vol. IX(1), April 2025 pp. 108-120

LEGAL ISSUES AND MODELS OF OWNERSHIP FOR INTELLECTUAL PROPERTY MATERIALS WITHIN BLOCKCHAIN SYSTEMS.

PRAKASH JOHRI*

ABSTRACT

Blockchain presents IP rights with a radical opportunity for effective decentralized form of registration, licensing and protection of their assets. These features to create indestructible ledgers, to execute smart contracts and for decentralized compliance could redefine how IP is managed. Though, with emerging technologies like the use of block chain there lies some legal issues, including jurisdiction issues, legal ambiguities and issues to do with ownership and enforcement. This paper seeks to explore these challenges and some pertinent problems that are associated with them such as the identification of use of aliases by the participants within the blockchain system, interface of dib territorially bounded IP laws and the global facet of blockchain and lack of legal recognition of blockchain generated evidence. These problems raise questions about ownership claims, possession of rights, and settlement of transnational disputes.

In order to overcome these challenges, this paper recommends the accreditation of blockchain records as well as fair contracts, using smart contracts for mitigating IP transactions, and building global guidelines that can align jurisdictional rules. It promotes the adoption of the security technology that shields its intellectual property information and the legal experimentation area of the blockchain called the regulatory sandbox. Synergistic relationship between technologists and lawyers is underlined as crucial in developing dynamic regulations that capture technology.

Lastly, this paper suggests how the use of blockchain technology can be incorporated into current and developing IP legal systems to support a sustainable system of innovation protection and creators' rights. With the help of effective and innovative approaches and with calming the IP environment by promoting cooperations globally, a true potential of blockchain in transforming the IP management for the better can be defined.

I. INTRODUCTION

Blockchain is an open, distributed register that can be used as a more secure method of recording and sharing of information. Blockchain was developed by Satoshi Nakamoto in the year 2008 as the public ledger that supports Bitcoin; a system where transactions are approved and recorded in a system of computers shared by all users of the network. The decentralization also leads to the elimination of middlemen as centralizing authorities which helps also in minimizing the risks of such manipulations or frauds and increases the rate of trust in transactions.[1]

* Prakash Johri is a 3rd year student pursuing B.B.A. LL.B. (Hons.) from Himachal Pradesh National Law University, Shimla. His areas of research are Intellectual Property Rights and Alternative Dispute Resolution. He has interned with reputed organizations like Shardul Amarchand Mangaldas & Co. and Indian Oil Corporation.

[1] Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, BITCOIN (2008), https://bitcoin.org/bitcoin.pdf.

These features – and especially a system of separate blocks' invariance and timestamping – imply a number of benefits necessary for the effective functioning of complex IP applications. IP management was for a long time based on centrally located registries which recorded ownership, licenses and cases of conflict. Blockchain presents itself as an innovative solution since it enables creators to register their word, assert and protect their ownership and perform IP transactions using smart contracts.[2]

Some of the blockchain solutions in IP are as follows Digital copyright registration, this is where a creator can timestamp its work on the blockchain with an aim of providing evidence on the date of creation.[3] Such systems on Ethereum mean that the smart contract handles royalties to eliminate middlemen in protecting the rights of creators. Blockchain can also play a role in licensing agreements of patented products and also supply chain tracking in case of patented product.[4]

However, blockchain being decentralized and offer anonymity in addressing identity further complicate legal concerns of ownership, rights and jurisdictions. These challenges underline a very important reason for the adjustment of the existing laws to accommodate the adaptation of blockchain technology in the already existent IP system in a very proper manner.[5]

Blockchain remains more pertinent to IP registration, licensing and enforcement due to the following: (i) characteristics; (ii) decentralization, (iii) immutability and (iv) transparency. It provides a stable environment to safely document ownership of IPs and to promote the transactions and to prevent infringements of license agreements.

With IP registration, blockchain is the distributed ledger that offers certainty of ownership through the use of hash functions and timestamps. In contrast to conventional IP regimes, which depend on a centralized authority to register a user's IP, blockchain can facilitate autonomous registration through smart contracts, the authenticity of which can be checked by anyone. For instance, to make sure that one's creation is acknowledged, creators can store their content on Ethereum or other industries-specific IP blockchains. Several voices of research argue that blockchain can

[2] PRIMAVERA DE FILIPPI & AARON WRIGHT, BLOCKCHAIN AND THE LAW: THE RULE OF CODE 101-05 (Harvard University Press, 2018).
[3] Mark Lemley, *IP in a World Without Scarcity*, 90 N.Y.U. L. Rev. 460, (2015).
[4] Primavera De Filippi, *Blockchain Technology and Decentralized Governance: The Pitfalls of a Trustless Dream*, 20 WIPO J. 97 (2019).
[5] David Gervais, *The Regulation of Blockchain in Intellectual Property*, 23 WIPO J. 45, 47-49 (2020).

specifically contribute to cutting back the bureaucracy, increasing the transparency of the processes and preventing fraud in IP systems.[6]

Smart contracts, such as self-executing agreements and terms of licensing, help also to overcomplicate licensing of IP on blockchain. These contracts cut across royalty payments for usage rights that are inserted directly into the blockchain.[7] This shifts the reliance from intermediaries and lowers the transaction costs in IP transactions hence making them more effective and easier. Nevertheless, legal issues are critical when it comes to smart contracts – how and to what extent such contracts can be enforced, especially when a conflict emerges or when an event affects provisions of the contracts.[8]

Last but not least, blockchain aids enforcement through making it easier to monitor, in real-time, the use of IPs and infringement of the same. Blockchain in combination with Decentralized Identifiers ["**DIDs**"] makes it possible to establish accountability for rights ownership and usage in the international digital market that is essential for many industries. However, there are still troubles connected to enforcement both because of the problems concerning competence of jurisdictions and because of the absence of the use of the records created by blockchain protocols in different legal systems.

II. CHALLENGES REGARDING IP OWNERSHIP ON BLOCKCHAIN PLATFORMS

Blockchain technology being disjoined and indelible hinders efforts to recognize, define, and protect rights to ownership of intellectual properties. Although blockchain has presented innovative approaches to IP registration and management, its characteristics cause legal uncertainties as well as enforcement issues. This section presents challenges such as concerning authorship attribution, ownership disputes, and legal jurisdiction concerns.

A. Identifying Ownership

The very architecture of the blockchain, where large numbers of contributors provide pseudonymous input into art or some other type of product, complicates who owns the work. The conventional frameworks of IP like copyright or patent are established based on identifying one or several individuals, who would be stakeholders. Blockchain transactions, however, occur under

[6] Primavera De Filippi & Aaron Wright, *supra* note 2.
[7] Nick Szabo, *Smart Contracts: Building Blocks for Digital Markets*, TRUE VALUE METRICS (1997), https://www.truevaluemetrics.org/DBpdfs/BlockChain/Nick-Szabo-Smart-Contracts-Building-Blocks-for-Digital-Markets-1996-14591.pdf.
[8] Kevin Werbach & Nicolas Cornell, *Contracts Ex Machina*, 67 DUKE L.J. 313 (2017).

the ledger's cryptographic keys and not through the real-life identities, which makes it challenging to identify who owns them rightfully. Also, decentralized applications (dApps)/ non-fungible tokens (NFT) based on the blockchain require work from different parties. Present laws still have difficulty in addressing such dispersed participation and increasing questions can be posed regarding common ownership and individual claims.[9]

For instance, self-executing code on incorporated blockchain that is known by smart contacts may provide automatic ownership after the specific set of conditions have been met. However, such rules are straightforward, and they lack sophistication in huge, jointed projects where the issue of possession arises, as De Filippi and Wright have pointed out, blockchain offers technological solutions for keeping records of contributions, but it does not elucidate the problem of authorship as a legal matter.[10]

B. Establishing Ownership

Blockchain's decentralized and secure setting also enables timestamping and the provision of a form of cryptographic proof of authorship, the lack of which would constitute a prima facie case against the owner. Nevertheless, most jurisdictions still do not accept records from a blockchain as the proof of ownership of an IP. For instance, in respect of Berne Convention, copyright is automatic, and it arises at the time of work creation; however, in most cases proving a specific time of creation in a court depends on the manuscript or electronic file. Yet, records based on blockchain technologies guarantee the information's authenticity and quality though their admissibility as evidence becomes an issue since those are not integrated into existing legal frameworks.[11]

Smart contracts take the ownership establishment to new and higher levels of complexity. These are normally used where the licensing terms and royalties are stated but the structure is deliberately unyielding. They may not protect against such events like late delivery of goods, defaulting of payment or disagreements. In their paper, Werbach and Cornell state that the "code is law"

[9] Jane K. Winn, *Blockchain and the Future of Commercial Transactions*, 22 STAN. J.L. BUS. & FIN. 157, 160-64 (2017); Marta Belcher, *The Intersection of Blockchain Technology and Copyright Law*, 28 FORDHAM INTEL. PROP. MEDIA & ENT. L.J. 529, 542-45 (2018).

[10] Primavera De Filippi & Aaron Wright, *supra* note 2; Shlomit Yanisky-Ravid & Xiaoqiong (Jackie) Liu, *When Artificial Intelligence Systems Produce Inventions: The 3A Era and an Alternative Model for Patent Law*, 39 CARDOZO L. REV. 2215, 2230-35 (2018).

[11] Michèle Finck, *Blockchain Regulation and Governance in Europe*, 39 OXFORD J. LEGAL STUD. 160, 172-75 (2019); Joshua Fairfield, *BitProperty*, 88 S. CAL. L. REV. 805 (2015).

approach embedded in smart contracts can be inapposite with other legal tenets including the doctrine of especial remedy in contract.[12]

C. Enforcing Ownership

One of the major problems in enforcing the operations on blockchain platforms is the fact that they function at the global level and are distributed. An IP law is country-relative as blockchain is cross-border; sometimes the legal system used as a reference is not clear. For instance, a blockchain IP sensitivity, related to contributors from several nations and disseminating in different countries, may lead to different judgements which may be contrary in nature.[13]

Furthermore, since blockchain entails the distribution of identity, it makes it difficult to protect one's IP. When transactions are pseudonymous then it becomes very hard to identify infringers. Even where infringers can be identified the mechanisms for enforcement such as injunctions or takedown notices cannot be affected on the decentralized platforms since there is no central authority through which enforcement can be affected. Gervais also says that blockchain is lawless and needs new methods of governance that will be decentralized other than being a lawless enforcer.[14]

D. Legal Ambiguities

The first of them is the conflict and confusion in legal regulation of the interaction between blockchain and IP law, resulting from the absence of uniform international legislation for software-linked to blockchain technology. Whereas, through blockchain a secure and an unblemished record of ownership is maintained, the legal acceptance of such records is not uniform in different jurisdictions. With innovations of various forms and uses of the underlying technology, some countries have started adopting the blockchain by allowing records from blockchain to be admitted as evidence of ownership while others are still skeptical of the technology.[15]

Furthermore, it is murky who owns/takes responsibility for blockchain as it runs on pseudonymity in a legal way. This greatly throws a spanner in the works of appropriate identification of the parties to a conflict, which is especially important for putting forward or counteracting an infringement of IP rights. Adding to the confusion is the term "code is law" typically tied to block-chain.

[12] Kevin Werbach & Nicolas Cornell, *supra* note 8; Shaanan Cohney et al., *Coin-Operated Capitalism*, 119 COLUM. L. REV. 591 (2019).
[13] David Gervais, *supra* note 5; Angela Walch, *The Path of the Blockchain Lexicon (and the Law)*, 36 REV. BANKING & FIN. L. 713 (2017).
[14] DAVID GERARD, ATTACK OF THE 50 FOOT BLOCKCHAIN: BITCOIN, BLOCKCHAIN, ETHEREUM & SMART CONTRACTS 201-05 (Amazon Kindle Edition, 2017).
[15] Primavera De Filippi, *supra* note 4.

However, as smart contracts eliminate control by legal professionals and carry out transactions and agreements as programmed, than they are not capable of adapting to circumstances where equitable relief or contingencies surface, thereby triggering conflicts as related to different legal doctrines.[16]

E. Jurisdictional Complexities

As blockchain works on the decentralized model, having no central authority, it brings a twist while deciding concerning jurisdiction when it comes to solving disputes. Conventional IP litigation is often determined depending on the place of the parties or in the territory in which the alleged infringement was recorded. As in blockchain, the transactions happen across the distributed ledger connecting different nodes located in several countries; therefore, there is uncertainty regarding the governing law.[17]

This cross-border characteristic in the blockchain platform can thus result in two different legal frameworks' application and enforcement issues. For instance, when two parties are engaged in a dispute involving use of non-fungible tokens minted within a particular blockchain, and the contributors to the said blockchain hail from different jurisdictions, the legal proceedings, together with the IP laws regulating rights over such tokens and ways of enforcing such rights, will not be the same. This is decision-making that has to be done internationally because the laws have not been harmonized to support such matters.[18]

III. Analysis Of How Blockchain Impacts Traditional Legal Framework For Ip Ownership

A. Smart Contracts and Licensing Agreement

Licensing procedures and royalty management are two areas where smart contracts, self-executing agreements based on blockchain technology, help. Max Raskin mentions in his article, "The Law and Legality of Smart Contracts", that processing these transactions automates paperwork and increases transparency. [19] Yet, smart contracts are rigid in ways. As it was mentioned previously, traditional law provides ways to interpret and change the contracting party's agreements in the case of unforeseen conditions, but smart contacts do not offer such opportunities. Problems arise

[16] Kevin Werbach, *Trust, But Verify: Why the Blockchain Needs the Law*, 33 BERKELEY TECH. L.J. 487 (2018).
[17] Angela Walch, *supra* note 14.
[18] Michèle Finck, *supra* note 12.
[19] Max Raskin, *The Law and Legality of Smart Contracts*, 1 GEO. L. TECH. REV. 305 (2017).

generally where a party needs to rely on either equitable remedies or corrections to errors made in the contract code.

B. Effects Relevant to Creative Industries

Blockchain changes the way creative industries conduct matters of ownership, use, and commercialization of assets through offering ownership portals to creators for direct relations with the audience. This does away with middlemen like publishers, agents, or record labels and other structures of marketing. Artists can utilize blockchain platforms to mint tokens that represent their artwork, being opposed to conventional coins, and giving a guarantee that the items being sold are original. As Casey and Vigna stressed in The Truth Machine this democratization decreases cost and further increases revenues for share-for-share models.[20] Still, decentralization also means that creators are more exposed and have to work on enforcing their rights as well as operating in sophisticated blockchain systems. Furthermore, the immutability of records on the Blockchain could pose problems to artists who intend to recall or edit their works circulating on the Blockchain because of emerging reputation issues.

As per Indian legislation, Copyright is contained under the Copyright Act of 1957 regarding protection of IPs on creative work.[21] On the one hand, blockchain provides the data on creation and ownership, which go directly to independent evidence on the other hand, there are several issues that may be potentially problematic: First, Indian evidentiary rules are not using the concept of the blockchain timestamp as such. Internationally, The Berne Convention enables the rights-holder uniform protection in the member countries but has not figured out NFTs or any technical advancements at the moment.

C. Tokenization of Intellectual Property

Tokenization enables IP assets to be represented through tokens which are swappable, licensable or can be fractioned. It brings the ownership of IP asset investments within reach of smaller investors who can now acquire fractional interest in a patent or trademark. However, Tapscott and Tapscott in Blockchain Revolution explain that the same function of tokenization also provides liquidity where there used to be none, and this includes patents or copyrighted works.[22] However, tokenization has raised new legal issues on its own. For example, who and how will decide on the

[20] Michael J. Casey & Paul Vigna, The Truth Machine: The Blockchain and the Future of Everything (St. Martin's Press 2018).
[21] The Copyright Act, No.14 of 1957.
[22] Don Tapscott & Alex Tapscott, Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies is Changing the World (Portfolio 2016).

allocation of a tokenized asset or solve a conflict connected to it? Are these digital representations covered by IP laws or are they subject to securities regulation or both? Tokenization also has issues of transparency; while the fractionalization of an asset means that there could be different parties with different access rights to an asset, there are problems with enforcement and compliance.
In India's securities law, this kind of tokenized IP assets could fall under securities under the Securities Contracts (Regulation) Act, 1956, despite this fact that would entail strict regulation. Globally, countries such as the United States of America and the European union are struggling with regarding tokenized IP as securities or intellectual property.[23]

D. Redefining Enforcement Mechanisms

Right from the nature of the technology, its transparency and traceability enhance the protection of IPs since the proprietors can track the use and transfer of their works in real time. For instance, the DTC (Digital Termination Code) of NFT marketplaces such as OpenSea shows how blockchain can create ownership and history, thus preventing fakes and misuse. In "IP in a World Without Scarcity" Lemley explains how blockchain may also contribute to re-imagining enforcement thinking through real time monitoring and traceability.[24] However, such enforcement mechanisms via the blockchain come with fresh forms of unfairness. On-chain or smart contracts tools may be used by 'end-users' to 'exempt themselves from liabilities' thereby negatively impacting the inexperienced creators. Furthermore, decentralized platforms do not have assigned authorities and many times, there is no hierarchical structure to report someone to or to enforce take down request or more severe measures.

India had exceptions for fair use in the Copyright Act, but with blockchain's autonomous removal process, it raises questions whether those who use this technology are considering fair uses.[25] On the international front, the World Intellectual Property Organization has only recently begun to direction the discussion toward the usage of blockchain in enforcing IP rights but has not offered authoritative guidance on this subject.

IV. IDENTIFICATION OF POTENTIAL LEGAL REFORMS

Blockchain technology has completely changed the way of thinking in the legal framework governing the protection of IP. Even though it has the potential to promote IP registration, licensing, and enforcement, the application of the blockchain technology involved is completely

[23] SEC v. Ripple Labs, Inc., No. 20-cv-10832, 2023 WL 4407071 (S.D.N.Y. July 13, 2023).
[24] Mark Lemley, *supra* note 3.
[25] The Copyright Act, No.14 of 1957, § 52 (Ind.).

decentralized, unmodifiable and facilitates cross-border transactions. Solving these problems requires complex legal improvements and the creation of new systems that align capabilities of the blockchain with corresponding IP systems. It is against this background that this discussion seeks to assess some of the possible reform measures to meet the increasing legal problems as they evolve.

A. Admittance of the Blockchain System as an Evidence in Intellectual Property Disputes

Among all the difficulties that can be encountered on the way to the widespread implementation of blockchain technology, one of the most significant is the non-acknowledgment of records produced by blockchain applications as legal evidence. Because of the use of cryptographic timestamping system, as well as the properties of block chain[26] that make it very difficult to alter once it has been created, blockchain can offer reliable proof of authorship and ownership. Nevertheless, national laws regarding IP tend not to provide provisions for the acceptance of such electronic evidence.

Proposed Reform:

Revise evidence acts to incorporate the recognition of records that use blockchain technology as proof of authorship or ownership as well as history of transactions. For example, Article 25[27] of the UNCITRAL Model Law on Electronic Commerce could be used as a reference in providing for particular provisions of blockchain.

B. For efficient decentralization of IP management and their standardization, smart contracts are a feasible approach

Automated contracts,[28] such that execute themselves, have the potential to efficiently manage IP licensing as well as royalty collection. Again, their legal enforceability under conventional contract law has not been settled. As factors that impede their adoption some of the challenges include, jurisdiction, interpretation and dispute.[29]

Proposed Reform:

Create best practices smart contracts for IP transactions to conform to national and international law. Unlike contractual clauses, standard contract provisions or templates could be developed by

[26] Primavera De Filippi & Aaron Wright, *supra* note 2.
[27] U.N. Comm'n on Int'l Trade Law, Model Law on Electronic Commerce, U.N. Doc. A/RES/51/162 (1996).
[28] Nick Szabo, *supra* note 7.
[29] Kevin Werbach & Nicolas Cornell, *supra* note 8.

the International Chamber of Commerce ["**ICC**"] in cooperation with specific blockchain consortia. It felt necessary to set rules regarding the arbitration of smart contracts, such as fallback plans for the presence of humans.

C. In ensuring that membership-based organizations are fostered, jurisdictional frameworks need to be harmonized

Blockchain is transnational, and that means there are issues of which country or jurisdictions, an IP owner can go to have his or her rights enforced.[30] There are cases where one transaction or dispute is covered by the laws of at least two states.

Proposed Reform:

Create an international treaty or framework to cover the blockchain based IP systems. This treaty should provide jurisdictional sovereignty, conflict solving provisions and how the agreement is to be enforced. Amend current agreements, for instance the Agreement on Trade-Related Aspects of Intellectual Property Rights ["TRIPS"][31], to provide for block chain related provisions

D. When it comes to ownership, it is necessary to mention the collaborative and pseudonymous ownership.

Another challenge of decentralized platforms is that many are based on blockchain technologies involving collective creation,[32] and even when there is an author, participants can act pseudonymously.

Proposed Reform:

Reform the rules of protection for copyrights in contexts of distributed collaboration[33]. For instance, provisions could indicate how ownership is partitioned according to the records of contributions embedded on blockchains. New regulations should be aimed at making blockchain platforms verify the identity of their contributors based on the IP regulations and privacy standards.

[30] DAN SVANTESSON, LAW BEYOND BORDERS: JURISPRUDENCE FOR A DIGITAL WORLD 44–48 (2019).
[31] Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299.
[32] Jeanne C. Fromer, *Expressive Incentives in Intellectual Property*, 98 VA. L. REV. 1745 (2012).
[33] Mark Lemley, *supra* note 3.

E. Establishing Third Party Resolution Systems

One would also have thought that traditional litigation is slow, costly and not fit for agile blockchain contractualism. Conflicts as to who owns an idea or whether or not a deal signed has favorable terms, impede advancement[34].

Proposed Reform:

Set up special blockchain-approved ADR instruments with the help of online arbitration[35]. These mechanisms could engage smart contracts to execute an arbitration award as agreed by the contract terms. Organize common decentralized autonomous organizations for solving controversies, controlled by legal organizations in different countries.

F. Making up for the Lack of Interaction Between Technologists and Legislators

One of the biggest challenges that stand in the way of reform is the short distance between technologists and legislators. Due to the technical characteristics, the legal responses provided tend to run contrary to the goal, [36] when it comes to Blockchain.

Proposed Reform:

Hold cross-disciplinary weekly meetings with technologists, legal scholars and policymakers to write effective flexible regulation. Encourage the implementation of blockchain education programs to lawmakers in order to help sharpen their knowledge on blockchain and its associations with IP law.

G. Paving The Way for Improved Privacy and Security

In as much as the integration of blockchain tries to bring about transparency, it ends up revealing information on the proprietary nature of the IP information. Transparency thrives with privacy[37] in today's society and challenges must be met in the middle.

Proposed Reform:

Set legal requirements for the execution of IP-related transactions utilizing block-chain technology such that all associated information is safeguarded behind encryption codes recoverable only by

---

[34] ETHAN KATSH & ORNA RABINOVICH-EINY, DIGITAL JUSTICE: TECHNOLOGY AND THE INTERNET OF DISPUTES 112–15 (2017).
[35] Claudia Prömmer, *Decentralized Dispute Resolution and Blockchain Arbitration*, 23 INT'L ARB. L. REV. 211 (2020).
[36] PRIMAVERA DE FILIPPI ET AL., BLOCKCHAIN TECHNOLOGY AND GOVERNANCE: ADDRESSING THE LEGAL AND POLICY CHALLENGES 1–3 (2018).
[37] WOODROW HARTZOG, PRIVACY'S BLUEPRINT: THE BATTLE TO CONTROL THE DESIGN OF NEW TECHNOLOGIES 75–79 (2018).

the allowed parties. Force blockchain platforms to adhere to the international laws of data privacy including the GDPRs[38].

H. Promoting Innovation by Use of Regulatory Sandboxes

Numerous regulatory FLT s degrade most blockchain based IP systems and slow down innovation due to uncertainty.

Proposed Reform:

Establish regulatory sandboxes[39] in which those behind blockchains can experiment new IP management systems under legal safe havens. With appropriate initial conditions and instruments, these sandboxes can offer some insights that would appear useful when establishing the adaptable regulations. Promote Public Private Partnerships ["**PPAs**"] to provide funding for blockchain innovation concentrated on using IAMs.

V. CONCLUSION

Solving legal issues connected with the deployment of blockchain-based IP systems can only be achieved through several approaches that include; the passing of sufficient legislation, improvement of technologies, as well as collaboration among countries. In this regard, legal systems should include blockchain-generated records, establish the criteria for smart contracts, synchronize the legal requirements of different jurisdictions, and promote interdisciplinary co-operation to enhance innovations while preserving the IH assets. Such changes will guarantee that the benefits of blockchain in increasing the efficiency of the management of IP will be developed to the extent, and the rights of creators and innovators will be protected.

In addition, forming a worldwide consensus in enforcing IP through treaties and cooperation can bring consistency and anticipation to laws governing the same all over the world. It is in this context that the commitment from the international organizations- WIPO and WTO; will be instrumental in the pursuit of these endeavors.

Finally, it is all about the role of proactive as the initiative will help to build up the new technologies before facing challenges and at the same time flexible in order to overcome all the challenges in the times of technology. It is imperative that future laws do more than 'fill the void' but foster a

[38] Regulation (EU) 2016/679, General Data Protection Regulation, 2016 O.J. (L 119) 1.
[39] Financial Conduct Authority, *Regulatory Sandbox Lessons Learned Report* (2017).

sound and competitive environment in the blockchain/IP space for all relevant participants. The roles of law and technology have to be corresponding such that the regulations should start advancing as technology to depend on Blockchain before reaching the potential of transforming Intellectual property management.