

## Blockchain Technology and Intellectual Property Rights

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Blockchain is a decentralized, peer-to-peer network based public, encrypted and immutable digital federated ledger system. This paper focuses on interplay of blockchain technology and intellectual property rights (IPRs). It explores the avenues where blockchain technology can be useful in processing of IP applications, maintaining IP records, licensing and smart contracts, enforcement and management of IP rights. Apart from the use of blockchain in IP management, other uses of blockchain technology for various e-governance schemes initiated by government of India and state governments have also been highlighted.

**Keywords:** Blockchain, Patent Prosecution Highway, India Chain, licensing, inventorship

It's an era of disruptive technologies. These technologies are rapidly evolving and changing the way we live and conduct business. It will not be exaggeration, if we rate this era as the most fluid period in the history of human evolution; when we are witnessing the technologies outpacing each other in record time. Artificial Intelligence, Cloud Computing, Virtualization, Internet of Things, Blockchain, Deep Learning, etc. have become buzz words giving an ever widening canvass of technological developments. Intellectual property rights (IPRs) and technological developments are complementary supplementary to each other. The rapid growth in technology requires corresponding IP laws to keep pace with such growth.

*“Disruptive technologies such as Block-chain and the Internet of Things will have a profound impact in the way we live and work. They will require rapid adaptation in our workplaces”<sup>†</sup>*

- Shri Narendra Modi,  
Hon'ble Prime Minister of India

IP offices across globe witness a quick influx of patent applications relating to AIs, Cloud Computing, Virtualization, Internet of Things, Blockchain technology and related distributed ledger technologies. While the IP communities across the globe are concerned about devising appropriate IP laws to protect these emergent technologies, the true potential of these latest technologies need to be leveraged in IP regime itself by utilizing their mettle

to address issues ranging from inception of a possible IP to its enforcement. These latest technologies may be used in wide ranging applications like re-engineering processes of prosecution, protection of IPRs, their enforcement and promotions.

This paper shall confine itself to Blockchain technologies and various possibilities it offers for the IP regimes and other possible applications of Blockchain Technologies in the field of e-governance and public good.

### Blockchain Technology

Blockchain technology is a decentralized, peer-to-peer network based public, encrypted and immutable digital federated ledger system. The shared decentralized ledger is maintained by the participants themselves and do not need a third party intervention. The technology is tamperproof as data put in to the blockchain cannot be tampered without being noticed. It offers multi-dimensional utility as it can store literally any kind of data; be it crypto currency, transactional information, contractual data, design data etc., immutability, traceability and no third party invention are unique attributes which make the blockchain technologies an exciting proposition in today's era, which is vulnerable to cyber attacks on centralized systems.

The Blockchain technology involves storage of information in encrypted independent blocks, which are linked using hash pointers. These hash pointers link one block to another to form a chain i.e. blockchain. These blocks are independently time-stamped and contain individual transactional data.

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The ledger is maintained in decentralized manner wherein no subsequent transaction is possible without the consensus of the network participants.

### Blockchain and IP – A Two Way relationship

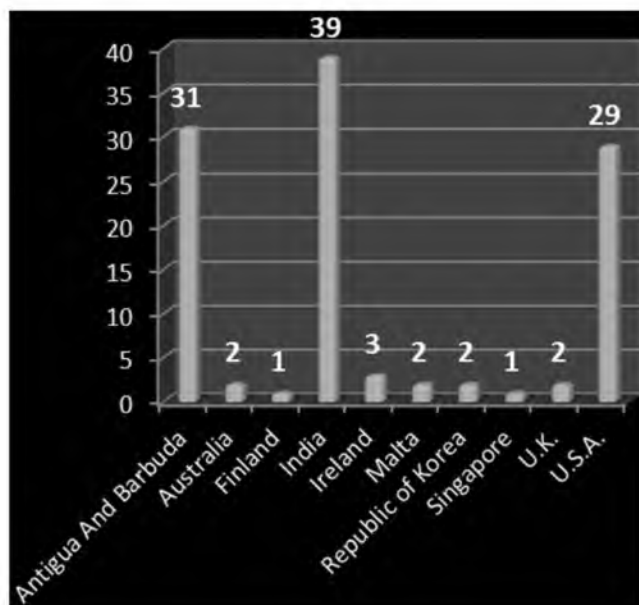
IP and Blockchain have dual relationship, whereby IP system protects blockchain on one hand, and Blockchain technology can be utilized to strengthen the IP regime on the other.

### IP protecting Blockchain

With the world gearing up to the use of blockchain to harness unexplored potentials of various industries, intellectual property can play a key role in future. There has been a steady growth in the number of entities hoping to secure patents over technology using blockchain as a base. A glance of filing of patent applications in Blockchain technology at Indian Patent Office (IPO)<sup>2</sup> reveals that nearly 112 applications published so far, the contribution from Indian applicants is considerably high to the tune of 39 applications.

### Blockchain Strengthening IP Regime

A sound intellectual property system requires strong, traceable and verifiable records of IP rights. In the present scenario, where IP records are being maintained at each IP offices in silos; there is every possibility of the data not being in sync. In such a situation, ensuring the correctness of data and its continuous updation poses a big challenge. With the advent of blockchain technology, IP offices across the globe can be immensely benefitted by using these technologies in maintaining their IP registers.



The immutability, reliability, security, efficiency and federated features of blockchain may be used throughout the life cycle of IP rights be it registration, licensing, contractual agreements and enforcement. The blockchain technology has the potential to be used in the following activities:

#### Creation of IP

Blockchain has immense potential in establishing evidence of first inventorship (in patents)/creatorship (in copyright)/first use in trade (in trademarks). This will not only help in identifying the rightful inventor/creator/proprietor, but would also lead to minimizing significant number of litigations.

#### Transmission of Data on Blockchain while Filing for IP Rights

The filing data maintained on blockchain will have sufficient evidentiary value to determine the rights of first filer in a “First-to-File” regime. It also negates any possibility of tinkering with the database.

#### Synchronized Search Databases

Blockchain technology can be used to synchronize the internal as well as external search database. This will help the patent examiners in searching the invention for anticipation by providing a single consolidated platform for patent literature.

#### Record Keeping, Ledger Maintenance and Data Verification

The IP offices across the globe maintain IP registers either in paper form or electronically. These registers have evidentiary value in court of law to justify the right of the holder. It also contains records of subsequent transactions of these rights. The registers can well be maintained using blockchain technology whereby ensuring correctness of data and real time updation of records in case of transfer of rights with due audit trails. The data verification will be much simpler as it will be totally tamperproof.

#### Collaboration between IP Offices and World Intellectual Property Offices (WIPO)

Blockchain having immutable/traceable feature will prove to be very useful in modern schemes like Patent Prosecution Highway (PPH) while collaborating with other IP offices during prosecution of IP applications. The information sharing with WIPO will also be easier if the data is available and maintained using blockchain technology especially while working as International Searching Authority (ISA) /International Preliminary Examining Authority (IEPA) and/or Receiving office (RO).

**Detecting and Preventing Counterfeiting**

When the data is maintained on blockchain, tracking and detecting IPR violations like fake goods, parallel imports etc and providing evidence of genuineness would become easier. It will help detecting counterfeit goods by custom authorities thereby preventing their entry in the domestic market. The technology can find its use in preventing the sale of fake drugs in the country by tracking every step of its supply chain network.

**Licensing, Contractual Agreements and IP Rights Management**

Smart contracts enabled through blockchain technology will be immensely useful in licensing of IP rights and related contractual agreements; as the smart blockchain contracts can help in self-monitoring terms and their due execution, real-time payment and maintaining immutable proof of their execution etc. IP rights management will be simplified with blockchain based IP data since the information about both the rights and the right-holders as well as the probable and prospective users will be available on real-time verifiable basis.

**Advantages to Micro Small and Medium Enterprises (MSMEs)**

If the information regarding enforced and expired IP rights are made available on blockchain, it will help the MSMEs to invest their resources in the free domain without infringing others rights and also to use the technologies for which the IP rights have already expired.

**Better Enforcement Mechanism**

The genuineness of IP rights and their holders will help the enforcement agencies such as police, customs, excise and judiciary to settle the IP disputes expeditiously, if the IP data is made available on the blockchain.

**Blockchain Technology beyond IP**

Blockchain technologies holds promise for any field/sector which needs immutable/traceable record management. In India, apart from IP, blockchain technologies can be a game changer in the fields of real estate record keeping, financial record management, health sector and insurance sector. Real estate sector needs a traceable maintenance of title and its audit trail. Blockchain with its immutable record keeping can solve a long festering issue in Real estate/land record management. The recent cyber attacks on the centralized server based financial system and compromise of hundreds of thousands of

credit/debit card data of various national/international banks; accentuate the need of an alternative system for financial data maintenance. Blockchain offers a potential solution in this regard. Blockchain technology has the potential to transform health care by helping to set up Healthcare Information Exchanges having electronic medical records of individual patients together with their entire prescription history. Using it, not only the medical practitioners can provide personalized healthcare experience to patients but also the same records may be used in settling medi-claims. Blockchain can lead to smart insurance contracts expediting the claim settlement and minimizing fraudulent cases. Further, it may be used in creating a seamless smart ecosystem in insurance sector be it travel, crop, property or health insurance.

**Government Initiatives in India on Blockchain**

In recent past, the Government of India has shown keen interest on transforming its economy to digital economy. Various steps have been undertaken by the government to adopt and enhance the use of latest technologies. As a premier think-tank of the Government of India, National Institution for Transforming India (NITI) Aayog provides critical knowledge, innovation and entrepreneurial support to the country. It is exploring the use of blockchain and Artificial Intelligence (AI) in diverse areas such as education, healthcare, agriculture, electricity distribution and land records. The institution is exploring a platform called 'IndiaChain' – a blockchain-enabled infrastructure for Indian enterprise and government.<sup>3</sup> Once implemented, this will be world's largest blockchain implementation program in governance. Further, NITI Aayog has released a discussion paper on National Strategy for Artificial Intelligence in June, 2018 which envisages establishing a decentralized data marketplace that is based on blockchain technology.<sup>4</sup> Apart from laudable initiatives from Union Government, State Governments have also shown their enthusiasm in adopting blockchain technologies for digital transformation in governance. States like Maharashtra,<sup>5</sup> Andhra Pradesh,<sup>6</sup> Telangana,<sup>7</sup> Karnataka<sup>8</sup> and Kerala<sup>9</sup> are exploring the possibilities to use distributed ledger technologies for their e-governance initiatives. National Association of Software and Services Companies (NASSCOM), the apex body for IT BPM industry in India, has recently signed a pact with blockchain research institute to evangelize blockchain ecosystem in India.<sup>10</sup>

### Conclusion

It is evident that blockchain technology has immense potential to cater the needs of IP offices across the globe. The sooner IP offices adopt this technology in to their day to day activities; it will yield better results in terms of faster examination, reliable record management, smart licensing and contractual agreements. The technology will not only help improved prosecution but also prove useful in enforcement of IP rights and settlement of IP infringement disputes. Though, Blockchain has enormous potential to offer, there are certain restrictions in terms of security, network size, speed, growth rates and transaction rates. Time and again apprehensions have been raised about the possibilities of choking of blockchain enabled network/system in case of huge number of transactions within a fraction of time. These challenges need to be addressed effectively in order to reap the fullest benefit of the blockchain technology.

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