

Blockchain Receipts and IP Laws: Determination of IP?*

Invited Researcher: Abhinav Kumar MISHRA**

Blockchain has become a buzzword to be spoken by persons of almost every field. It has affected every field of life than FinTech only. Blockchain is the base technology powering Bitcoin—the famous currency of the world today. Blockchain is a decentralized publicly shared ledger which records tamperproof and immutable entries in a block over a network with the help of cryptographic keys and hash function. Blockchain actually keeps tracks of any records through a decentralized environment where transactions to vet by the receipts approved through a consensus of the members of the community. With the advent of technology, Blockchain has moved to new steps of doing something more than just recordkeeping i.e. smart contracting, using self-executable codes inconsonance with legal language. As social and personal life is being affected by Blockchain, big Business players are rushing to have exclusive control on share of technology through the use of patent. However, as a mix of open source software technology to give effect to business methods, patenting of Blockchain technology is a bit twisted. The paper analyses the patentability of Blockchain based patents.

Furthermore, Blockchain receipts are not transactions per se, but contain transaction information and fuels the Blockchain networks. But since, the Blockchain receipts— which earlier used to record only transaction data— have started keeping medical records, identity, codes, contracts, data files etc., because of technology expansion and different usages of Blockchain networks. Then talking about the appropriate IP protection of the Blockchain receipts, is the best thing to do. This research finds the best solution to protect the Blockchain receipts from existing IP solutions. Another question this research would deal is to decide the protection for Blockchain receipts keeping in mind their specific problems, while dealing with their issue of ownership. This research would answer these questions, and the relation to protection of Blockchain technology through patents and other IP protection of Blockchain receipts.

I. Introduction

* This is a summary of the report published under the 2018 Collaborative Research Project on Harmonization of Industrial Property Right Systems under a commission from the Japan Patent Office.

** Assistant Professor, Lloyd Law College.

The Blockchain is the new future of world. The Blockchain is the new face of changing society, business and while the law also concerns with the change in society; Blockchain can prove to be the technology force even changing the way law deals in. At the same time law require to protect the technology more so that it could grow and benefit people. The Blockchain as yin and yang of the real world, can perform the best balancing of the both opposite force in world of IP law: means Blockchain can be used as medium to manage IP in a way to enforce better protection and before it does so, Blockchain needs the IP law protection to sustain and grow.

Because of the sensation, the Blockchain has created in the business world, it led Blockchain based startups to raise more than US \$ 1.3 billion in first half of the 2018 only, surpassing the total of 2017.¹ The sensation doesn't stop here. Some days later, ICO offering of one startup based on Blockchain, only collects US \$ 4 billion of amount, more than double of the last total amount.² From government to big businesses all have an eye to adopt the Blockchain technology, for one or the other use, for which Blockchain is really good at—multi-faceted. With the entry of the big potent players in the Blockchain market, the use of IP based protection to grab hold of the portion of the Blockchain to share a part in market has increased, viciously. The best mode to do so is the patents, and the biggest players are using it so; increasing the risk of patent trolling.

II. Blockchain: What is?

Blockchain is *simply* a digital ledger which has the quality of keeping immutable data and uses the decentralized peer to peer (P2P) technology to store and run, cryptography and hash technology to make data secure. In simple words, Blockchain is a kind of public ledger, where any information can be stored but cannot be changed or modified once stored. The information/any transaction is backed up and verified by number of public nodes available in the Blockchain network. The network works with the help of number of people, not with the help of a central server, thus making it decentralised publicly networked secure system to keep information. The idea of this information network can be equivalent to a public ledger document to keep track of transactions not only in finance but also useful to keep records of any field.³

¹ See, Jason Rowley, 'With at least \$1.3 billion invested globally in 2018, VC funding for Blockchain blows past 2017 totals' *Tech Crunch* (May 2018) available at: <https://techcrunch.com/2018/05/20/with-at-least-1-3-billion-invested-globally-in-2018-vc-funding-for-Blockchain-blows-past-2017-totals/>

² Kate Rooney, "A Blockchain start-up just raised \$4 billion without a live product" *CNBC* (31 March, 2018) available at: <https://www.cnn.com/2018/05/31/a-Blockchain-start-up-just-raised-4-billion-without-a-live-product.html>

³ "Blockchain: the ledger that will record everything of value to humankind" 5 Jul. 2017, <https://www.weforum.org/agenda/2017/07/Blockchain-the-ledger-that-will-record-everything-of-value/>; Lemieux, Victoria L. "Blockchain technology for recordkeeping: Help or hype." Unpublished report (2016) available: https://www.researchgate.net/publication/309414276_Blockchain_for_Recordkeeping_Help_or_Hype; Victoria Louise Lemieux, (2016) "Trusting records: is Blockchain technology the answer?", *Records Management Journal*, Vol. 26 Issue: 2, pp.110-139, <https://doi.org/10.1108/RMJ-12-2015-0042>

Blockchain is the same technology framework which was used in Bitcoin. The Pseudonymous Satoshi Nakamoto– founder of Bitcoin– made the framework and software of Blockchain in public domain by publishing a concept paper about it.⁴ Therefore, it formed a part of prior art and made Blockchain technology non-patentable. However, the improvements and significant changes in the technology cannot be denied patents, if used cleverly. Also, the question was that Blockchain technology is the combination of software technology or protocols with some publically known technologies (hash, internet and cryptography, Merkle tree and proof of concept of Hashcash), which is used to solve some solutions based on some business models. Patents law prohibits patenting of publically known technologies, algorithms, mathematical solutions, abstract business ideas. The software and business models are not patented, given some conditions of having technical effect and solution can be proved.

III. Blockchain Patents

1. Basics of Patent Law

Patent Law does not allow patents for the inventions already in public, forming the part of prior art; however this does not stop them from allowing the significant change or improvements addressing the technical gap or providing ‘solution to the problem’. US law patents anything under the sun as new and useful process, machine, manufacture, or composition of matter or *improvements thereof*,⁵ to promote the usefulness of science and arts; except the abstract ideas, laws of natural and natural phenomena. Therefore, basic the patent requirements are being new and useful. These requirements have been expanded further in § 102 (novelty) § 103 (nonobviousness) alongwith § 112 (specification), which must be satisfied. Japanese Patent Law patents “highly advanced creation utilizing the laws of nature.”⁶ Japanese Patent Law requires any invention to be novel (not publicly known or worked), industrially applicable and involving inventive step.⁷ The criteria of "industrially applicable invention" excludes "an invention which is impractical to utilize as a business", "an invention which practically cannot be actually performed", and "medical acts".⁸ Article 29, paragraph 2 of Japan Patent Law requires inventive step to follow in a way of non-obviousness, similar to the EU law where law requires inventive step in form of being

⁴ Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System." Bitcoin (first published on October 2008) <https://bitcoin.org/bitcoin.pdf>.

⁵ USC 35 § 101.

⁶ Article 2 (1) of the Japanese Patent Act.

⁷ Article 29, Paragraph 1, Japanese Patent Act.

⁸ *See also*, Shuwa, Guidebook for Japanese Intellectual Property System available at: <https://shuwa.net/english/information/2015/0406.html> at page 11-12.

non-obvious, however, follows a different approach to test it. EU follows ‘*solution to problem*’ approach to determine patentability of an invention on two steps– one, what technical problem is being solved by invention by looking into the prior art and; Second, whether that solution is obvious to person skilled in art. India also has the same requirements of novelty, inventive step and industrial applicability along with a long list of non-patentable inventions under section 3 of Indian Patent Law. However, the standard of requirements taken by IPO have been a bit stringent than other countries, and judiciary have also brought the same legacy forward in some recent cases.⁹

2. Blockchain Patents: close proximity with software and business method patents

Blockchain in essence, is open– open to join, open records (in classic version) and also open in technology. Satoshi Nakamoto used all the known and publically worked technologies in novel way. The Blockchain or Bitcoin may have got the status of invention under the patent law, if sought protection under patents law by Nakamoto before publishing the Bitcoin concept paper. However, as mentioned earlier, the patentability is not hampered absolutely as patents law allows the significant improvements– not merely a workshop improvement¹⁰– in the technology featuring new technical effect.

Blockchain technology features the use of software and protocols on a known abstract idea of public and distributed ledger to solve some business specific problems or to apply any business model on Blockchain technology to achieve some technical effects. Therefore, patenting of Blockchain shares close proximity with software and business model patents as Blockchain combines the use of both: software and business models. Now the debate on patenting computer implemented and business method patents seems to be settled, but of course, the standards of patentability vary in different countries and involve a lot of issues and differences. The variety of standards in examination of these patents are regulated largely by the patent office guidelines or the judicial interpretation.

In US, the courts have rejected the idea of blanket ban on computer implemented patents, but have stated that patents based on abstract ideas are not patentable.¹¹ The patentability of such abstract idea is based on a two-step test as laid down in *Mayo*¹² and adopted for computer implemented inventions in *Alice*,¹³ where court discarded the old machine-transformation test.¹⁴

⁹ *Novartis v. Union of India* (2013) 6 SCC 1 on repatenting (evergreening) of new form of known element in a drug; held not patentable; *NATCO v. Bayer*; where court granted the compulsory license of a high priced drug.

¹⁰ *Windsurfing International v. Tabur Marine* 1985 RPC 59 at para 21; *See also*, *Bishwanath Prasad Radhey Shyam v. Hindustan Metal Industries* (1979) 2 SCC 511.

¹¹ *State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998).

¹² *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S.Ct. 1289, 1296-97 (2012).

¹³ *CLS Bank Int'l v. Alice Corp. Pty.*, 134 S.Ct. 2347, 2353 (2014).

Alice two-step test questions the abstractness of the idea and removes the blanket prohibition in consonance with the IP clause of constitution of US, if that abstract idea has capability to do something “significantly more”, than being just an incarnation of abstract idea. The *Alice* and the following decisions thereafter, made it clear simply that taking an abstract idea and implementing it onto a computer will not show inventive concept, and had a negative impact on software patents in US. However, in 2016, several decisions made software patents back into business by granting patents on ‘patents related to a self-referential database’,¹⁵ ‘internet content filtering technology’,¹⁶ and ‘automatic lip synchronization and facial expression animation using computer-implemented rules.’¹⁷ Therefore, it is pretty clear that US courts would be accepting the idea of Blockchain based inventions, if they found to incorporated any idea of business in an “significantly more” way, giving some technical effect. Any technical improvements of Blockchain technology, effecting in significant improvements, would be easily patentable, should they pass non-obviousness.

EPO’s approach to software patents is based on the interpretation of *such as clause* of EPC. Where EPO, just like Japan and India, does not allow to look into the software without inclusion of hardware in the claimed invention, which also happen to ‘provide solution to technical problem’. This is possible in case of technical improvements case of Blockchain inventions. However, it is said that Novel and non-obvious steps of a business method are very unlikely to be viewed as “technical” by the EPO in any scenario, even if those business method steps result in beneficial technical effects.¹⁸ The use of new hardware (improved Blockchain technology) having technical character, regardless of the novelty of business method, may be patentable under EU law given the context it qualifies non-obviousness requirement.

Whereas Japan, considers the patent eligibility of software and business method patents¹⁹ on two steps-

- Is it creation of technical ideas utilising the laws of nature?
- Is the information processing by software specifically implemented by using hardware resources?

Such inventions must be utilizing a law of nature *as a whole*, irrespective of the requirement of

¹⁴ *Bilski v. Kappos* 130 S.Ct. 3218, 3227-29 (2010).

¹⁵ *Enfish v. Microsoft*.

¹⁶ *Bascom Global Internet Serv. v. AT&T Mobility LLC*, 827 F.3d 1341, (Fed. Cir. 2016). The Federal Circuit found inventive concept as technological based solution to a problem by carefully looking at BASCOM’s patent claim as a whole rather than just looking at components of computer and internet technology.

¹⁷ *McRO, Inc. dba Planet Blue v. Bandai Namco Games America Inc.*, 120. USPQ2d 1091 (Fed. Cir. 2016).

¹⁸ “Patentability of Software and Business Method Inventions in Europe” available at: <http://mewburn.com/resource/patentability-of-business-method-and-software-inventions-in-europe-2/> See also, Case T531/03.

¹⁹ An explanation on the eligibility of BM related inventions was added in the revised Examination Guidelines which came into force in Apr. 1, 2017, and it was clarified that the BM related inventions which include technical features are not necessarily ineligible.

utilization of software,²⁰ but does not accept *mere presentation of information, or mere propagation of prior art*. Therefore, Japan accepts the patentability of computer implemented inventions in rather more open way than any other, in the light of March 2016 revised guidelines²¹. In India software and business methods are not patentable *per se*, but adopts the same interpretation of such as clause in EU and allows software and business methods in combination of hardware resources to be patentable if they pass requirements of patentability: novelty, inventive step and industrial applicability. However, broad and stricter non-patentability clause of Indian Patent Law leaves very less scope of patenting,²² than other countries, for the patents related to— combination or arrangement of other technologies with Blockchain,²³ technological improvement of Blockchain technology and even application of generic Blockchain on any business methods—²⁴ unless, such invention is completely new with new efficacy and non-obvious.

Summing up, patent eligibility of any Blockchain technology can be said to observe following conditions-

1. New significant technological changes/modification/replacements solving any technical problem may be patented.²⁵ (Software and protocol replacement, which leads in significant change in the working of Blockchain structure or framework.)
2. Any significant improvements—if more than merely a workshop improvement²⁶ (update leading to significant performance change or solving a problem.)
3. Any combination of Blockchain technology with abstract business ideas, can *only* be patented, as long as, claims prove to be ‘significantly more’ or having solution to a problem or technical gap in applying Blockchain technology to that abstract idea— something like EU’s ‘solution to a problem’ approach. (Most of the cases of business ideas using the Blockchain technology.)

²⁰ “...irrespective of whether computer software is utilized, satisfy the requirement of eligibility for patent without needing being examined from a viewpoint of computer software.” (Examination Guidelines, Part III, Chapter 1, 2.2)

²¹ The revised Examination Guidelines have been applied to examinations on or after April 1, 2016. Available at: https://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/handbook_sinsa_e.htm

²² Section 3 of Indian Patent Act has a long list of non-patentable invention expressly barring the patent of (d) the mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant. (e) a substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof or a process for producing such substance; (f) the mere arrangement or re-arrangement or duplication of known devices each functioning independently of one another in a known way.

²³ Section 3 (d) of Indian Patents Act and stricter workshop improvement norms.

²⁴ See Section 3(d) “...mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant.” Also Section 3 (f) bars “the mere arrangement or re-arrangement or duplication of known devices each functioning independently of one another in a known way”.

²⁵ See, *Enfish v. Microsoft*

²⁶ See, *McRO v. Bandai Namco* (Fed. Cir. 2016) where Patent claims were directed to the automatic lip synchronization and facial expression animation using computer-implemented rules. See also *BASCOM v. AT&T*.

IV. Blockchain Receipts and IP Protection

1. Blockchain Receipts: What is and Why Needs Protection?

Blockchain is a merely a digital record keeping mechanism like a ledger which does the immutable and irreversible record keeping. For example, in Bitcoin, if you transfer an amount, the information of amount transaction with time shall be recorded in a block, which means the Blockchain receipts, in Bitcoin's Blockchain network, contain transaction data in text. For different other use cases of Blockchain, the data and content would be large, complex and valuable which will need more stringent protection.

After a long debate, an improvement of Bitcoin came as a strong competitor to Bitcoin, named Ethereum.²⁷ Ethereum as an advanced version not only records transaction data but also smart contracts: self-executable codes based on real life conditions resulting in binding and effective nature similar to a legal contract— means smart contracts. With advancement in time and technology, Blockchain has widened the scope of application to many innovative and brilliant business ideas making the core recording of Blockchain receipts to use variety of contents like financial transaction data,²⁸ codes,²⁹ contractual/conditional instructions,³⁰ personal data files,³¹ evidence files,³² records,³³ and also medical records.³⁴ Therefore, the nature of Blockchain has become more crucial like a database and the variety of different contents makes it difficult for a definite protection. We will have to analyse the different types of Blockchain receipts to reach to best conclusion. The significant of them all are: *One*, text based simple transaction receipts as in Bitcoin or other crypto currencies, and records like registry; *Second*, code and conditions as in Smart contracts, which may range from simple trigger of any contingency to complex ones to create structures like Decentralised Autonomous Organisations (DAOs); and *third*, personal data files like picture and videos saved in Blockchain receipts on Blockchain cloud.

²⁷ <https://ethereum.org/> Ethereum is a decentralized platform for applications that run exactly as programmed without any chance of fraud, censorship or third-party interference.

²⁸ E.g. Bitcoin and other coins utilising Blockchain.

²⁹ Self executable codes on Blockchain network is the basis of evolution of Smart Contracts.

³⁰ Smart Contracts.

³¹ "Decentralized Cloud Storage — Storj." <https://storj.io/>; "File Coin" <https://filecoin.io/> and "Sia." <https://sia.tech/>. See, also: Sherman Lee, "Blockchain Is Critical To The Future Of Data Storage -- Here's Why" Forbes June 8, 2018 available at: <https://www.forbes.com/sites/shermanlee/2018/06/08/Blockchain-is-critical-to-the-future-of-data-storage-heres-why/#551dfe033e9e>

³² "保全网-区块链电子数据存证、电子合同、原创版权保护服务平台." <https://baoquan.com/>. Baoquan.com is the first Blockchain data attestation service provider.

³³ "RecordsKeeper - Record Keeping & Data Security Platform on" <https://www.recordskeeper.co/>. Accessed 21 Oct. 2018.

³⁴ "Medicalchain - Blockchain for electronic health records." <https://medicalchain.com/en/>. Accessed 21 Oct. 2018.

(1) Patents and Trademarks: Out of the Scope of Subject Matter

Patents Law protects the rights of inventor in an invention. The Blockchain technology is an invention, however, the Blockchain receipts– which contain data cannot be patentable as patent law prohibits patenting of abstract ideas, laws of nature, natural phenomena, mathematical formula, algorithms, and text information. Therefore, Blockchain receipts are totally out of the purview of patents. Trademarks Law protects the marks, words, text, colors which are used to distinguish between the other’s services with an objective to save the confusion on the part of the consumers. If we look in the situations of Blockchain receipts, they cannot have any such objective or use to cause confusion or to denote to any goods or services of one from another. And above all the Blockchain receipts contain unique information each time when the transaction process.

(2) Copyright

Copyright law protects variety of subject matters including: writings, music, art works, architectures, photographs, paintings, sound recordings, cinematograph works (audio-video works) and *also* computer programs and computer databases. The Blockchain receipts, in so far as they relate to simple transactions, will not be able to receive copyright protection of information/data contained as simple generic information cannot be copyrighted. The smart contracts are confusing as they are equivalent to legal contracts on one hand and being computer programs on the other. The smart contracts, being too general, will lose their originality requirement of copyright law. But copyright is most helpful in protecting personal data files of any nature of any individual on Blockchain clouds. And also copyright can well protect other Blockchain receipts if they are being asked to be protected as database of the Blockchain network. Japan, India and US can cover this under copyright law however, EU has a sui generis Database law.

(3) Trade Secret and Unfair Trade Competition Law

Trade secrets protects commercially viable secrets or secret information. In Japan, trade secrets are protected by the Unfair Competition Prevention Act (UCPA).³⁵ The object of the trade secret law is two folds: *One*, “ensuring fair competition among business operators, and thereby contributing to the sound development of the national economy.” *Second*, helping maintain

³⁵ UCPA Article 2(6) defines a trade secret as: (i) technical or business information useful for commercial activities such as manufacturing or marketing methods, (ii) that is kept secret; and (iii) that is not publicly known.

"standards of commercial ethics."³⁶ Unlike the Japan and US, Indian trade secret law lacks the dignity of a having a statute, and is largely based on contract law dealt by common law principles.³⁷ The basic requirement of secrecy cannot be found in generic version of public Blockchain as the transactions are public by nature. However, if the Blockchain is permissioned which non-disclosure agreements with users/nodes or encrypts information to save it from others, trade secrets might be useful.

Apart from prohibiting wrongful acquisition, unauthorized use, and wrongful disclosure of such protected information, Japanese Law also protects against Acts causing confusion of well known indication, Acts of using famous indication unjustifiably, Acts of imitating the configuration of goods, Acts invalidating copy management technology, Acts invalidating access management technology, Acts of infringing domain names, Acts causing misleading, Acts injurious to another person's business reputation, which can be helpful for protection of Blockchain receipts.³⁸

V. Conclusion and Suggestions

Blockchain and Blockchain receipts both require a special attention of law makers, judiciary and law enforcement. Blockchain inventions are getting patented already at good rates. However, that also exposes to the risk of patent trolling and also evolution, usefulness and promotion of Blockchain (by a patent of some portion of technology to render it unusable at large.). The Patent Offices must be careful in granting the patent. Apart other requirements and checks, patent offices can also think of taking into consideration the test of operability.³⁹ Since Blockchain is open and most of its parts are being used in different new inventions, Patent offices should care if any patent which uses Blockchain technology, is not resulting a significant portion of the Blockchain's basic technology *inoperable* for others. The promotion of usefulness of science is best taken care if people can use the basic technology and improvements are protected as being new and leaving scope for

³⁶ Jay Dratler Jr., Trade Secrets in the United States and Japan: A Comparison and Prognosis, 14 Yale J. Int'l L. (1989). Available at: <http://digitalcommons.law.yale.edu/yjil/vol14/iss1/3> at page 69.

³⁷ The UK recently implemented the EU's Directive on 9 June 2018 by the Trade Secrets (Enforcement, etc.) Regulations 2018 (the "Regulations"). Before this, trade Secrets were already protected in the UK by the common law of confidence and the UK was seen as something of an exemplar in terms of that protection.

One significant change to note is that the Regulations introduce a statutory definition of "trade secret". In essence, a trade secret is information which:

Is secret and not generally known or readily accessible to those who normally deal with the information;

Has commercial value because it is secret; and

Has been subject to reasonable steps to keep it secret.

Ash won Schwan, "Protecting and Exploiting your Trade Secrets in 2018" July 19, 2018 <http://www.blplaw.com/expert-legal-insights/articles/protecting-and-exploiting-your-trade-secrets-in-2018>.

³⁸ Article 2(1) of UCPA

³⁹ *Bilsky v. Kappos* (if the patent of the invention would not lead to preempting others from using the technology.)

others to fit in.

Blockchain receipts can be best protected under present copyright law, database protection and UCPA of Japan. However, a sui generis law can be a good suggestion, given the specificity and width of the Blockchain technology and as the question of ownership of Blockchain receipts is still a debatable issue under the classic database protection.