IMPACT OF BLOCKCHAIN TECHNOLOGY IN INTELLECTUAL PROPERTY

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ABSTRACT

The blockchain, as underlying technology of Bitcoins, has implications that reach far beyond the original intent as virtual currency. Blockchain is attractive to many different industries because of its potential uses. Different types of data can be added to a blockchain, from cryptocurrency, transaction and contractual information to data files, photos, videos and design documents. In this twenty first century when the whole world is becoming digital the modern technologies have also been introduced to promote the digitalization. These modern technologies sometimes subject to issues and demonstrate inadequacies regarding modern developments. In this context, the rise of the distributed, resilient and transparent blockchain technology could potentially have huge beneficial impacts. Through this paper, we first introduce blockchain technology with the example of Bitcoin and inspect its potential use. In this paper, we investigate about how blockchain technology affects the Intellectual property. Intellectual property (IP) itself seems antiquated in the Internet Age with gluts of free data just a Bittorrent away. But IP is an active issue within the crypto-community, especially regarding customized blockchains in which there is tremendous potential for profit. The trend toward IP will accelerate as the blockchain and digital currencies go mainstream. In fact, blockchain tech is already being used to register digital copyrights in a way that is both immutable and time stamped. It is called "the poor man's copyright" because registration is often free. And it cements together the concepts of Bitcoin and IP. We then explain the advantages and disadvantages of this technology. Through this paper we further describe how the intellectual property can be protected by using blockchain technology. We then explore the issues occurred in the field of copyright and patents. We further explore the institutional support for the technology necessary for a successful implementation, in form of legislations and governmental projects. It is inferred that this technology promises an exciting impact on open innovation, where it could function as the missing framework for prosperous cooperation and solve ethical questions as well as organizational problems. Lastly, we concluded that blockchain technology proved to be a beneficial for an economic field.

Keywords: Blockchain, Bitcoins, Cryptocurrency, Intellectual Property, Beneficial Impacts, Implementation, Legislation, Innovation.

1. INTRODUCTION

IP is a contradiction in terms and an artificial construct that blocks human progress. IP would obstruct the development of Bitcoin and similar technology while sharply diminishing its value to individual freedom.[1] And the technology is continuing to develop with new types of distributed ledgers such as hash graph software, which seeks to address issues of scalability.

A blockchains is implemented by three technologies: a) private key cryptography, b) distributed peer-to-peer networks with shared ledgers, and c) protocols for performing transactions as well as ensuring security and record-keeping.

For the IP industry as we know it, blockchain technology is expected to open up a range of possibilities as well as challenges. Protection of IP through blockchains is necessary to accurately and securely record value transactions in the absence of bank. Blockchain is proved to be secure because each transaction or block is transmitted to all of the participants in the network and must be verified by each participant node. As there are multiple participants in the network , storing of information on the blockchain is perceived as near unhackable.

The price of one Bitcoin today is around 400[illegible] because Bitcoin is growing with a current market capital of over 70 billion USD and its value has risen about 600 percent year over year.

The U.S. Patent and Trademark Office has a track record of leaving applicants out in the cold if they seek patents for presenting other types of software or financial services inventions that are too abstract or obvious. The patent office has published nearly 700 blockchain-related applications it received between January 2011 and April 30 of this year. The office has granted 70 patents on blockchain technology during that time, Bloomberg Law data show.

Patents are an essential ingredient for companies looking to reshape the financial services industry or spawn profitable cryptocurrency-related businesses. Without them, companies

[1] *The Fraud of Intellectual Property*, Wendy McElroy, available at https://news.bitcoin.com/the-fraud-of-intellectual-property, last seen on 17/06/2018.

can't protect proprietary rights in high-tech ideas, attract investment, and license their technologies down the road to collect monopoly profits.

1.1 WHAT IS BLOCKCHAIN TECHNOLOGY

The blockchain technology was first introduced by Santoshi Nakamoto in 2008 and was used by Nakamoto to create digital currency bitcoin. Satoshi Nakamoto is an alias for the still unknown inventor, who claims that anonymity is necessary in order to protect both himself and the technology from authorities and industry-protecting organizations once the technology really starts to affect financial systems and other areas of society.

Blockchain Technology is a decentralized database, referred to as distributed ledger technology (DLT). It is a software that stores encrypted information on a computer and synchronizing the data across multiple computers. The data stored on a blockchain can relate to assets, transactions, contracts and agreements entered into by users of same block chain. Block chain technology offers a new means to register works, secure order of priority for inventions and logos, and authenticate personal identity or property information in an immutable way. Blockchain technology is the system that makes Bitcoin work, giving creative people effective ways to protect their Intellectual Property Rights. Recording IP rights in a distributed ledger rather than a traditional database could effectively turn them into "smart IP rights". Blockchain enthusiasts have praised the technology for its resilience to fraud, its transparency and relatively low cost of maintenance. As a result, many businesses are asking whether they might be able to use this technology to update existing systems, including in relation to intellectual property.

1.2 ADVANTAGES OF BLOCKCHAIN TECHNOLOGY OVER INTELLECTUAL PROPERTY

1. **Fast transaction** -Blockchain-based technology will allow you to avoid the wait time as you can easily carry out financial operations in minutes at any place round-the-clock. Interbank transactions can potentially take days for clearing and final settlement, especially outside of working hours. It can reduced transaction times to minutes and are processed 24*7.
2. **Low cost transaction**- By eliminating third party intermediaries and overhead costs for exchanging assets, blockchains have potential to greatly reduce transaction fees. With

distributed ledger technology, there's no need to engage costly intermediary services, such as lawyers, brokers and bankers, to ensure legitimacy and security for your transactions. By eliminating the third-party intervention, we can significantly lower transaction fees and optimise efficiency.

3. **High quality data-** Blockchain data is complete, consistent, timely, accurate and widely available.
4. **Reliable, durable and longevity-** Due to the decentralized networks, blockchains does not have a central point of failure and is better able to withstand malicious attacks. Distributed ledger technology enables tracking any product-related information, such as price, location, date, quality etc. over the whole product lifecycle, allowing businesses to address such supply chain issues as lack of transparency, reliability, traceability and security.
5. **Immutability and transparency-** This technology will provide transparency between all the parties and guarantee no data was altered or deleted, even if you operate in the semi-trusted environment. Changes to public blockchains are publicly viewable by all parties creating transparency, and all transactions are immutable, means they cannot be altered or deleted.
6. **Ecosystem simplification-** With all transactions being added to single public ledger, it reduces the clutter and complications of multiple ledgers.
7. **Empowered users-** Users are in control of all their information and transactions. Every single piece of unique content could be recorded on the blockchain. Content creators would have transparency into the impact they are making for brands or social networks and be properly rewarded for it.
8. **Process Integrity-** Users can trust that transactions will be executed exactly as the protocol commands removing the need for a trusted third party.

1.2.1 LAW ENFORCEMENT

As with insurance and banking, law enforcement is generally organized according to a traditional model. Whether "law enforcement" refers to government officers or private agents, law enforcement entails some centralization of power. The invention of the blockchain has spurred a new organizational model for law enforcement. In the blockchain model, intermediaries are cut out. This leads to reduced transaction costs and better protection of individuals' and organizations' rights. Besides, the blockchain raises a number

of legal issues, forcing legislators, regulators, and courts to offer a proper legal framework that can be replicated with the blockchain. These issues include transparency, misuse, and criminal fraud. By keeping all transactions transparent to millions of people, blockchain law projects provide tools to build a brand new kind of transparency.

The legal industry is taking its first steps toward adopting blockchain technology by creating the Global Legal Blockchain Consortium (GLBC). The GLBC envisions uniting the biggest law firms, corporations, schools, and major legal software providers, as well as court systems and governments in the future. Such global integration would completely transform the business of law by aligning firms, clients, and technology companies. Along with this initiative, several lesser-known global startups are striving to link the real world and blockchain activities in the field of law. For example, the Elliptic Company allows tracing of Bitcoin transactions. It offers investigation services to law enforcement agencies and leading Bitcoin companies.[2]

One more example of blockchain in law enforcement is Integra Ledger, a provider of a new foundation for security, integrity, and interoperability for coping with all legal information – documents, contracts, etc. The blockchain technology that forms the cornerstone for Integra allows them to preserve legacy investments of law firms and their customers.[3]

1.2.2 BENEFITS OF BLOCKCHAIN TECHNOLOGY FOR THE LAW ENFORCEMENT INDUSTRY:

- Near-instant money transfer
- Automation of contract performance and smart contracts
- Land registry and deed management
- Intellectual property rights
- Recording and maintaining property ownership and public records[4]

[2] Zakir Merchant, *How Blockchain Technology Will Revolutionise The Legal Services Industry*, Inc42, available at https://inc42.com/resources/blockchain-impact-legal-ecosystem, last seen on 17/06/2018.
[3] Lucy Liu, *Blockchain Technology Can Help Law Enforcement*, Michigan Business & Entrepreneurial Law Review, available at http://mbelr.org/blockchain-technology-can-help-law-enforcement, last seen on 17/06/2018.
[4] Tania H., *Implementing Blockchain Technology in Business*, available at https://rubygarage.org/blog/implementing-blockchain-in-business/, last seen on 17/06/2018.

1.3 DISADVANTAGES OF BLOCKCHAIN TECHNOLOGY

1. **Privacy, security and control-** While solutions exist, including private or permissioned blockchains and strong encryption, there are still cyber security concerns that need to be addressed before the general public will entrust their personal data to a blockchain solution.
2. The main problem in this technology is that is that it is easy to forge this kind of 'poor man's copyright'. The use of blockchain notary services for this purpose is an extension of the idea of 'poor man's copyright'. This idea is often presented as an almost free way to copyright something.

E.g-

(1) In April 2018, two founders of a tech company were charged with securities and wire fraud by defrauding investors with a fraudulent initial coin offering (ICO), which involves the selling of tokens for cryptocurrency.

(2) In late 2017, a cryptocurrency trader was also defrauded when another trader spoofed an exchange platform to steal cryptocurrency in an escrow fund. The incident is being litigated in a Delaware court.

3. **Cost-** Blockchain offers tremendous savings in transactions costs and time but the high initial capital costs could be deterrent.
4. **Large energy consumption-** The Bitcoin blockchain network's miners are attempting 450 thousand trillion solutions per second in efforts to validate transactions, using substantial amounts of computer power.
5. **Uncertain regulatory status-** Because modern currencies have always been created and regulated by national governments, blockchain and Bitcoin face a hurdle in widespread adoption by pre-existing financial institutions if its government regulation status remain unsettled.
6. **Nascent Technology-** Resolving challenges such as transaction speed, the verification process, and data limits will be crucial in making blockchain widely applicable.
7. **Cultural adoption-** Blockchain represents a complete shift to a decentralized network which requires the buy in of its users and operators.

8. **Integration concerns-** Blockchain application offers solution that require significant changes to, or complete replacement of, existing systems. In order to make the switch, companies must

2. PROTECTION OF IP THROUGH BLOCKCHAIN

- **Regular creation of IP –** The number of patent and trademark applications relating to blockchain technology is likely to increase dramatically. Currently, when searching the EPO's database Espacenet, the search returns 165 patent filings that mention the word "blockchain" and 69 that mention "bitcoin". A few years ahead, these advancement of patents may well prove very valuable. The millions of lines of code written can also constitute highly valuable IP, protected by copyright, database protection or kept confidential.
- **Blockchain protection –** Blockchains use several time-stamping schemes which opens up for more trustable recordable of intellectual property assets, resulting in less disputes, facilitating collection of royalties etc. Various blockchain start-ups are currently working on IP-related blockchain services. One example is Po.et (Proof of Existence 2.0), which is a shared, open, universal ledger designed to record metadata and ownership information for digital creative assets.
- **Blockchain authentification –** For detection of counterfeit or fake goods. Several applications have already been built or are underway that aim to track and identify products such as diamonds or fashion items and make duplication impossible, such as Blockverify, Everledger and VeChain. The latter is a chain management solution which can be used to track any kind of item.
- **Smart IP contracts –** Smart blockchain-proofed contracts and recordals may spell the end of backdated documents with e.g. invention dates and assignment dates. They will add reliability to the IP system to the benefit of IP owners and stakeholders. Agrello, based in Estonia, has received considerable hype lately. The company is developing an application for legally binding smart contracts, which are produced with the assistance of artificial intelligence and reflected in a public blockchain.
- **IP registry services –** When the IP registries replace their current centralized systems with blockchain technology, the records will become more trustworthy and also able to be updated and shared immediately. Useful applications can then also be built on top of

these records without having to await or physically verify the data.[5]

3. ISSUES OF BLOCKCHAIN TECHNOLOGY WITH IP

3.1 COPYRIGHTS

Blockchain technology can help creators capture the value they create by introducing the concepts of authenticity, condition, and ownership until then missing online. Promising solutions have started emerging in the troubled music industry, as well: the dot Blockchain project aims to replace traditional music formats such as MP3 and WAV with a new format (.dc) incorporating minimum viable data, which is metadata about who owns the song, who has the right to sell it, to play it, among others. This information would be stored on the blockchain and could be combined with smart contracts, offering functionalities such as restricting playback to legitimate owners only, or executing royalties and licensing agreements in real time. Most of the advocates are of the view that development of blockchain in copyright area could lead to "multi-territorial licensing policies and enhanced legal certainty for creators and purchasers while providing effective dispute resolution mechanisms, particularly in relation to tariffs, licensing conditions, entrustment of online rights for management and withdrawal of online rights", rebalancing the rights between creators, buyers and intermediaries, giving copyrights their original purpose back.

3.2 PATENTS

Protruding blockchain technology within the patent system could reduce inefficiencies in recording and agreeing the time of registrations in an efficient way. It is suggested that blockchain registration could be the first step in the patent application, providing proof of existence right from the beginning. More importantly, the technology could prove to be an effective tool to fight patent trolls, by offering companies a cheap and easy way to timestamp and create a trail of records for their inventions and trade secrets. These blockchain certificates could then be used to defend against litigating NPEs as notarized arguments proving existence, ownership, and integrity for the prior use defense. One decentralized ledger would also solve the problem of unifying the patent system across countries. This could vastly improve the effectiveness of IP management, speed up the innovation process in companies and foster the distribution of information across them through the ledger.

[5] Birgit Clark, *Blockchain and IP Law: A Match made in Crypto Heaven?*, World Intellectual Property Organization Magazine, http://www.wipo.int/wipo_magazine/en/2018/01/article_0005.html, last seen on 24/06/2018.

Patent examiners are absolute experts in their field, can be a great source of knowledge for anyone requesting a prior art report and with their legal background are the most qualified to settle disputes. Consequently, while blockchain technology certainly has great potential to improve a system that has not evolved as fast as the setting in which it operates, it is highly disputable whether it could replace it altogether.[6]

4. INSTITUTIONAL AND LEGISLATIVE SUPPORT OF BLOCKCHAIN TECHNOLOGY

There is a need for institutional and legislative support of blockchain technology because for the efficient application of technology.

The first issue is the legal binding of digital signatures used in blockchain. There have been cases of e- signature systems with design and security flaws, which is why governments have set complex standards. Habitually a valid signature is required to make contracts legally valid, a necessary precondition in case of legal disputes. In other words, for the previously explored potential of smart contracts to be unlocked, private key signatures must be recognized.

The second issue is the use of blockchain based evidence in court. The law stipulates very precise specifications for what is referred to as "admissible evidence"[7]. It is always possible to prove the reliability of the information since it is mathematically given by the blockchain, but it costs money and time, which drastically decreases efficiency and counterbalances the many advantages the technology could offer.

Another matter is the need for legislations to support the implementation of blockchain technology for copyright protection. Real reforms to copyright law have to come through government action. Blockchain technology can help creators track their creations and capture the value they generate, which is already a significant step forward compared to today's situation, but it does not solve the problem of unauthorized use: to remove infringing content, they must fall back on legal means.

[6] *Lock in attribution, securely share and trace where your digital work spreads*, available at https://www.ascribe.io/ last seen on 20/06/2018.

5. CONCLUSION

We have presented a study on the impact of blockchain technology in IP and innovation. We have shown that the blockchain technology provided strong timestamping, proof-of-existence as well as the potential for smart contracts and enabled the creation of distributed, transparent, cost-effective and resilient environments open to all and where each transaction is auditable. By applying blockchain technology to different IP, the copyrights could be enforced more effectively in the context of digitalization and render the patent system more efficient. The technology promises an exciting impact on open innovation, where it could function as the missing framework for prosperous cooperation and solve ethical questions as well as organizational problems. This exploratory study opens up several questions concerning the future of blockchain technology in innovation. While blockchain technology has seen first use cases and pilots in the patent system and for copyrights, secrecy, its impact on open innovation remains highly theoretical and needs further research on possible mechanisms and implementations to unlock its potential. We deem it likely that blockchain technology will have tremendous impacts on the way the world innovates and protects innovations.