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Intelectual propriety and technology transfer with Blockchain[1]

Propriedade intelectual e transferência de tecnologia com Blockchain

Propiedad intelectual y transferencia de tecnología con blockchain

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Abstract
The article introduces the concept of using blockchain for intellectual property. It also presents an international example of the use of this technology for the World Intellectual Property Organization WIPO. The discussion on the use of advanced technologies is open in the technological and legal fields since in this border area there are many challenges and even more considering the global trends in the use of post-pandemic digital systems. The discussion shows that the transfer of technology and intellectual property is possible, and also wishes to promote a more agile international and local law system to receive requests from the market.

Keywords: Blockchain. Intellectual Property. Technology Transfer. WIPO.

Resumo
O artigo apresenta o conceito de uso de blockchain para propriedade intelectual. Apresenta também un exemplo internacional do uso desta tecnologia para Organização Mundial da Propriedade Intelectual OMPI[4]. A discussão sobre uso de tecnologias avançadas esta aberta na area tecnologica e de direito pois, nessa area de fronteira ha muitos desafios e ainda mais pensando as tendências mundiais no uso de sistemas digitais pós-pandemia. A discussão mostra que na transferencia de tecnologia e na propriedade intelectual é possível, e também visa promover um direito internacional e local mais ágil em receber solicitações do mercado.

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Palavras-chave: *Blockchain. Propriedade Intelectual. Transferencia de tecnologia. OMPI.*

Resumen

El artículo presenta el concepto de uso de blockchain para la propiedad intelectual. También presenta un ejemplo internacional del uso de esta tecnología para la Organización Mundial de la Propiedad Intelectual OMPI. La discusión sobre el uso de tecnologías avanzadas está abierta en el ámbito tecnológico y legal, pues en esta zona fronteriza hay muchos desafíos y más considerando las tendencias mundiales en el uso de sistemas digitales pos pandemia. La discusión muestra que en transferencia de tecnología y propiedad intelectual es posible, y también promover un derecho internacional e local más ágil para recibir solicitudes del mercado.

Palabras clave: *Blockchain. Propiedad Intelectual. Transferencia de Tecnología. OMPI.*

Introdução

In Brazil, intellectual property is regulated by Law No. 9,279/96, (Industrial Property Law) which also defines in its CHAPTER VII, ASSIGNMENT AND ANNOTATIONS with its Art. 58 that the patent application or the patent, both with indivisible content, may be assigned, in whole or in part. In TITLE VI, TECHNOLOGY TRANSFER AND FRANCHISE in Art. 211 that the INPI will register the contracts that imply the transfer of technology, franchise contracts, and the like to produce effects on third parties.

For some time now, with new technology accelerated by the current pandemic, innovations are always faster with shorter times to define the certainty of intellectual property and the protection generated by its registration.

With the use of a new technology called Blockchain, it is possible to register any intellectual property in real time. The technology can also be used to secure any part of the production process or networking.

However, blockchain is not being used, especially in countries such as Brazil, which has potential but also difficulties in carrying out records, not only because of bureaucracy but because many people are getting involved in bureaucratic processes for a long time without consultancy. Despite the law pointing to the Nits as a support center for solving this problem.

In this article, we research the meaning of blockchain technology wishing to explain the possible use and link with intellectual property registration and law. This bibliography research explains the WIPO blockchain system as an example of a successful blockchain international application. The end of the article discusses how new technologies, like blockchain, could be used and the time issues in Brazil.

INTELLECTUAL PROPRIETY AND TECHNOLOGY TRANSFER WITH BLOCKCHAIN

The research is exploratory. The research steps are: 1) check the blockchain literature and propose a synthesis of the technology. 2) show an example of Wipo's proposal and make an assessment of the proposal's advantages and disadvantages

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with the use of the blockchain for Technology Transfer in Brazil, and 3) explain a theoretical example of the use of the technology.

Blockchain technology

Blockchain is a set of technologies that revolutionize the way business is run when some transactions are involved. The great popularity of the blockchain platform is due to the democratization of cryptocurrencies. Bitcoin and other digital currencies are just one use, the first in order of time, but currently no longer the only one. The use of blockchain has become increasingly accepted in the financial market and public and private institutions. Before approaching the topic of smart contracts, understand how the sets of technologies belonging to the blockchain that is the basis of everything work.

There are numerous definitions of blockchain, partly from scientific articles and partly from technical white papers from companies operating in this sector, but all definitions converge and refer to the work of Nakamoto (2008). Nakamoto is the pseudonym of an unknown author, who was the first to propose the blockchain platform and its first digital currency as an alternative to traditional currencies, criticizing the current economic model, centralized, hermetic, and subject to fraud, proposing a decentralized, secure system. and transparent. His work, strongly based on cryptography concepts and security protocols, started the development of a global and distributed ecosystem, enabling the creation of several technological platforms, all following the model presented in this article.

Thus Nakamoto (2008) proposed a decentralized system for transactions between interested parties, which uses cryptographic calculations to validate these transactions, eliminating the concept of “trust” and “third parties”. Therefore, transactions in a blockchain environment are mathematically irreversible, ensuring security and transparency.

The biggest players in Information Technology are investing billions of dollars in blockchain adoption, development, and dissemination. The company Crypto.com (2022), a reference in the cryptocurrency market, in its annual report reveals that in 2021 cryptocurrency users 300 million and that in 2022 they should reach one billion. There are numerous statistics on the market value of using Blockchain, and they all point to steady growth. That is why there is an interest in offering solutions for blockchain ecosystems. Big companies like Amazon, Microsoft, IBM, Oracle, SAP, and many others are investing resources to promote and support blockchain technology.

Some definitions of Blockchain extracted from the disclosure websites for specific blockchain solutions are as follows IBM: “Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets across a business network. An asset can be tangible (a house, car, money, land) or intangible (intellectual property, patents, copyright, trademark). Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and lowering costs for everyone involved.”

According to Amazon: "Blockchain technology enables organizations to streamline shared workflows such as supply chains by exchanging and tracking assets and transactions on a shared ledger. In enterprise use, blockchain networks are usually distributed among a group of partners (called a consortium), giving each partner real-time visibility into every transaction that has taken place. Each partner can also reject

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incorrect transactions before they are applied to the ledger, which simplifies auditing and greatly reduces the risk of fraud."

For Microsoft "Blockchain is a record-keeping and contract enforcement technology that uses encryption to make it extremely difficult to change history. It allows participants to share workflows by tracking changes to a shared record".

SAP "A database with information stored in blocks that can be copied and replicated across multiple computers. All these blocks are identical and synchronized with each other. When someone adds or subtracts data, the information in all of them is modified".

According to Oracle: "Blockchain is a registry of decentralized data that is securely shared. Blockchain technology allows a collective group of selected participants to share data. With Blockchain, transactional data from multiple sources can be collected and shared. Data is split into shared blocks chained together with unique identifiers in the form of cryptographic hashes. Blockchain provides data integrity with a single source of truth, eliminating data duplication and increasing security."

The TI uses blockchain as a series of transactions organized and recorded in blocks and in temporal order, where each block is linked to the other, through a header calculated with hash functions. Once the sequence of blocks is formed, it is impossible to modify it as it would be necessary to compute a new chain on time to replace the official sequence, and this is impossible with current computational means.

This structure does not require third parties involved in the validation of the chain, as the entire process of creating this distributed ledger is based on algorithms and irreversible mathematical functions, computed by machines. The algorithms used that are the basis of this process are the Proof of Work (PoW) (NAKAMOTO, 2008), Proof of Stake (KING et al., 2012), and Practical Byzantine-Fault Tolerance (PBFT) (CASTRO, 1999). These and other algorithms developed in these years are known as consensus algorithms and validate and build the globally valid blockchain chain.

These calculations are made on nodes of the Internet network with specific software, and these nodes are called "miners". These miners are rewarded with cryptocurrencies for the computing service provided and do not need third parties to be authorized to participate in this process (WANG et al., 2019). In this sense, fraud is practically impossible because everything is traceable and transparent for those involved.

This structure and this efficient distributed process lend themselves to a wide variety of uses, especially where the concept of a transaction is present, be it an exchange between interested parties.

The use of blockchain does not have legal protection in specific Brazil, but it can be compared, from the intellectual propriety legislation point of view to a computer program. A computer program, or software, is an organized set of instructions written in a programming language (source code) to perform one or more tasks. Such instructions are converted into a language that a device is capable of executing (executable code or object code(

A solid Intellectual Property system requires traceable and verifiable records of IP rights. In the current scenario where IP records are kept in each IP office in silos; there is the probability that data is not in sync. In such a situation, ensuring the correctness of the data and its continuous updating represents a major challenge. The international IP system is known to have several problems with efficiency and effective control. Blockchain technology allows you to overcome these bottlenecks.

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But the big question is how to register the blockchain in the national PI system, which is the only one considered valid in each nation and internationally. If every blockchain generated were registered in the system there would be an implosion of the central database. Also if it is not generated it implies that there is a parallel private and shared IP system that can create possible issues at the time of IP registration of something that has already been used in some blockchain or part of it.

Example of The new that uses blockchain: WIPO service

The World Intellectual Property Organization (WIPO, in English, World Intellectual Property Organization, WIPO) is a Public International Law agency headquartered in Geneva (Switzerland), part of the United Nations System. It was created in 1967 to promote the protection of Intellectual Property around the world through cooperation between States. It currently comprises 187 member states [2] and administers 27 international treaties.

WIPO launched PROOF WIPO – Reliable Digital Evidence in Geneva, on May 27, 2020, a year ago. WIPO PROOF provides a date- and time-stamped fingerprint of any file, proving its existence at a given time. The system provides tamper-proof evidence of the existence at any given time of any digital file, including datasets, in any format.

WIPO PROOF uses Public Key Infrastructure (PKI) technology to generate WIPO PROOF tokens. PKI technology is a reliable and well-established cryptographic technology, one of the most accepted and internationally recognized digital certification methods. WIPO PROOF was designed and developed following eIDAS standards.

According to WIPO website, the service creates a WIPO PROOF token, a timestamp fingerprint of the file or data, which can be used as evidence in a legal dispute.WIPO PROOF tokens provide the highest level of certainty that the date and time on the token are accurate and have not been tampered with. WIPO PROOF provides reliable and verifiable evidence in case of disputes and disputes about the existence and integrity of the digital file and its related IP rights.

WIPO PROOF tokens can be purchased one at a time for a modest fee or in bundles of multiple tokens at reduced rates valid for two years. These can be used to establish past existence, helping to prevent misuse and misappropriation, and can be useful in safeguarding intellectual assets at every stage of development, from concept to commercialization, whether or not they become rights formal IP. WIPO PROOF complements WIPO's existing PI systems, providing another tool for the global strategic management of intellectual assets.

Thus, this new WIPO PROOF service serves to certify the existence of a file or data at a specific time and is a type of concrete action that highlights its value and demonstrates what measures have been taken to protect it.

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Discussion Result: The Software protection and Technology Transfer in Brazil

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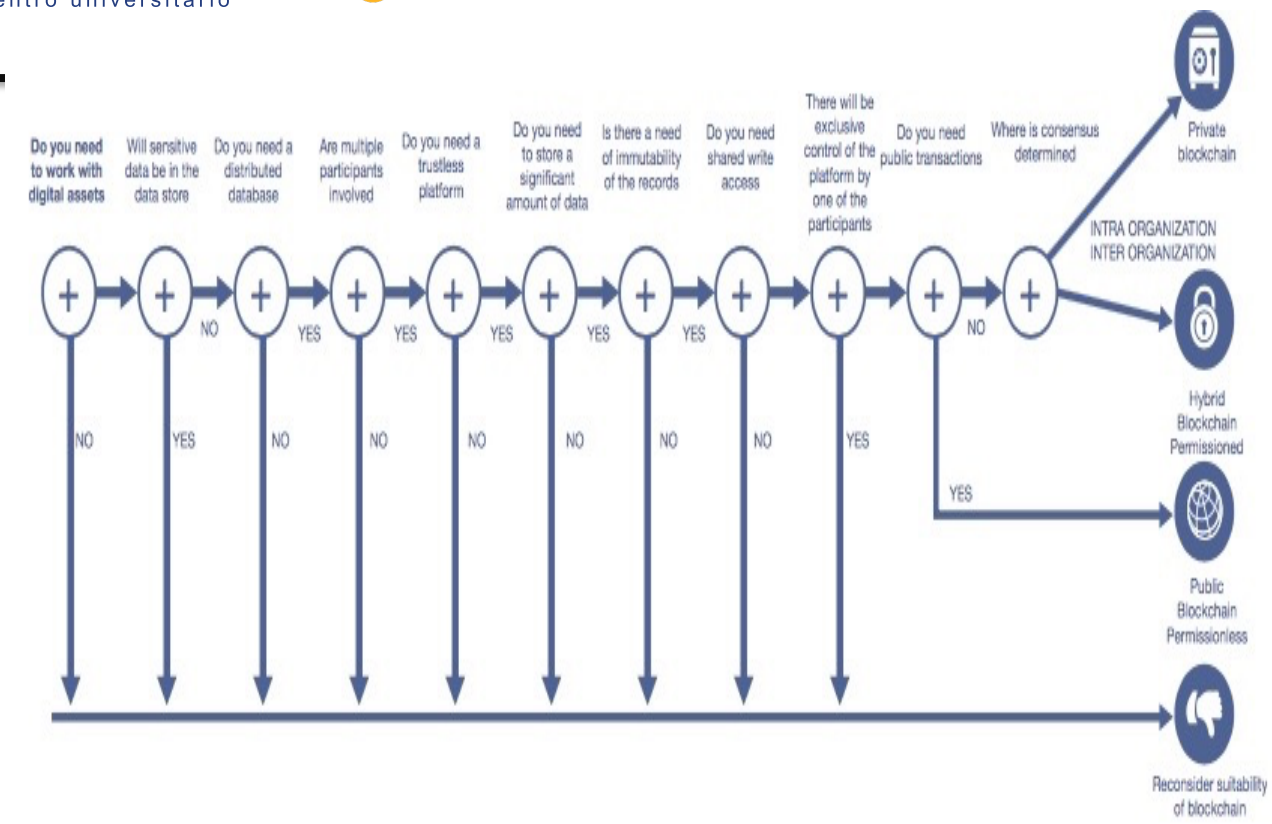

According to WIPO (2022), it is critical to determine whether or not the blockchain is an appropriate technology to improve or resolve business issues or problems. Before starting to use blockchain technology, people must be aware that Blockchain, like any other technology, can only solve some but not all problems. If blockchain technology is chosen, consideration should be given as to which blockchain should be applied. When defining which blockchain should be applied it is important to think about what criteria should be met. A decision flow is recommended.

Figure1 - Decision flow
Source: WIPO (2022) pg. 51

In our view, the use of Wipo technology thus creates software that can be protected with a certificate of ownership. In Brazil, even though the software is protected by copyright and, therefore, independent of registration, the National Institute of Industrial Property (INPI) allows the registration of computer programs through the electronic system.

According to INPI, registration guarantees legal security to its holder, in case there is any legal dispute and it is necessary to prove the ownership of the program. In other words, in the end, you must register for the program with WIPO technology in Brazil. This is rounding but it is the only solution if you do not have agreements between WIPO and INPI to have the double guarantee.

INPI's software registration process is similar to the blockchain process because before requesting registration, the applicant must encrypt the text or file that contains the source code of the computer program, using an appropriate algorithm to transform such code into a digital hash summary. This summary must be entered in

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the electronic filing form. It will also be necessary to include the Declaration of Veracity (DV), which will be created in the Union Collection Guide (GRU) system. (MACEDO and BARBOSA.2000)

The hash may include other copyright assets, such as music, screens, videos, animations, characters, and other assets that integrate, together with the software, the created work. This is very common in the case of games, for example. INPI recommends using the SHA-512 algorithm or a more recent algorithm to obtain the digital hash summary.

The next step is doing a Technology Transfer using the technology and registry set and the blockchain, once the software is registered with the INPI. Technology Transfer (TT) is a process that disseminated one or more technologies and intellectual property from the person or organization that owns them to another person or organization. These transfers can take place among various subjects: universities, companies of any size, governments, third sector, and individuals, both formally and informally, both openly and secretly. TT can be considered a sub-process of knowledge transfer.

Autio and Laamanem (1995) consider that there is a Technology Transfer mechanism and channel. The first is any type of interaction between two distinct organizations where technology is transferred. The channel is the formal (contract) or informal connection between these organizations so that the mechanisms can be used.

For Bercovitz and Feldmann (2006) and Bozeman (2000), the mechanisms can be separated into formal and informal. Formal mechanisms are, for example, sponsored research agreements, licenses, or capital exchanges. An informal mechanism happens by “chance” when there is a way to start a relationship that, later, makes use of other mechanisms for the development of the knowledge transfer process.

Conclusion

It can be stated that the use of the blockchain for Technology Transfer, accepting the reasoning developed so far, has advantages of using the blockchain for Technology Transfer. These are implicit in the technology.

• fast procedure, no bureaucracy, low cost;
• proof of authorship/title of the software, in case of a lawsuit;
• increased protection against unfair competition, illegal copying, and piracy;
• important if there is an intention to trade internationally (remittance of royalties);
• legal security for the business;

advantages in due diligence and legal M&A transactions/possibility of safely selling the smart contract by transferring property rights;

What are the disadvantages of the current situation?

The main thing is that, in the case of the blockchain update, someone will have to request a new registration request. For every new update when a new code is generated, a new registration must be performed to ensure protection. Depending on the number of updates, the process became expensive and even unfeasible.

Thus, a mechanism favorable to the use of the blockchain could be a lower cost for software variation that will be offset by increasing the number of blockchains needed in cases of continuous technology transfer.

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