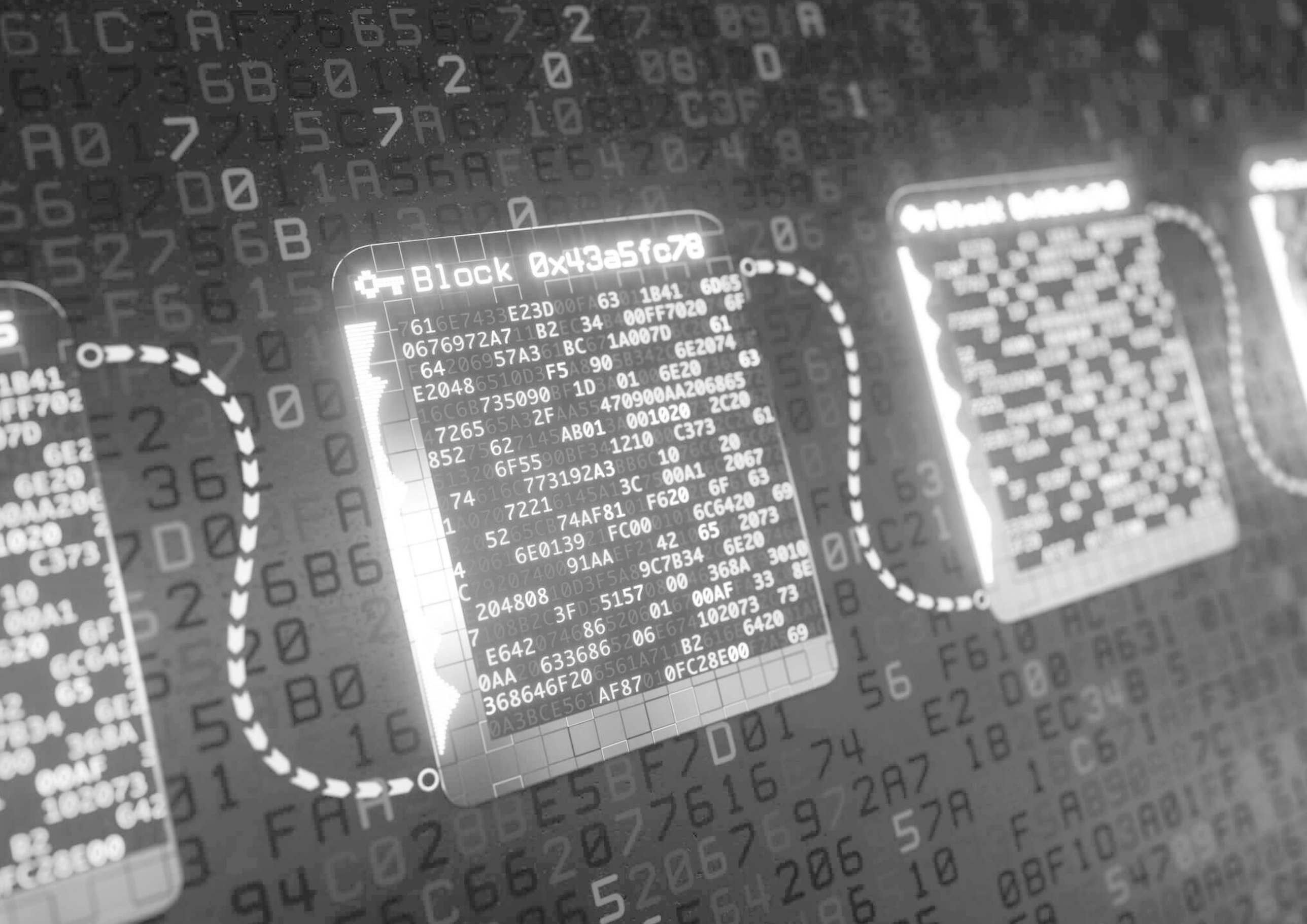
Block chain Guide

MATTOS FILHO > Mattos Filho, Veiga Filho, Marrey Jr e Quiroga Advogados


Block 0x43a5fc70

WHY A BLOCKCHAIN GUIDE?

As revolutionary as it is comprehensive, Blockchain technology has shown that it is here to stay. Far from being restricted only to the universe of cryptocurrencies, Blockchain will be the main tool for structuring and enabling business in a digital environment in the near future.

If transactions are made based on trust between parties and intermediaries, no technology in the digital world can better translate this environment, whether by its transparency, the immutability of its records, or because it allows the parties to be brought closer, removing unnecessary intermediaries in business.

Blockchain applies to several areas such as environment, infrastructure, payment methods, contracts, investment funds, healthcare, insurance, and real estate. Its impacts also vary, being felt across a range of legal areas including criminal, antitrust, data protection, compliance, tax, cybersecurity, asset management, corporate, intellectual property and litigation.

Mattos Filho Advogados has deep knowledge in all these areas and applications and knows how to guide and advise its clients. Our firm stands out as a reference and has the necessary expertise for the technology industry and for companies that depend on it for developing their business in different areas.

We hope that this guide will serve to clarify information about Blockchain technology and provide a reference for how we can assist our clients.

Happy reading!

* This guide should not be used as a legal opinion, nor is it intended to guide anyone for legal purposes.

CONTENTS

WHAT IS BLOCKCHAIN?

Blockchain is a technology for storing and transmitting information in a transparent, secure, and distributed network, that does not demand a centralized control body to exist.

As the name suggests, Blockchain is based on a chain of "blocks" that store digital information related to the transactions made between its users. Like a ledger, each Blockchain constitutes a database that contains the history of all the transactions carried out and validated since the creation of the first block of information.

How is this possible?

Transactions made by Blockchain users are grouped into blocks, which are validated by network "nodes". These nodes are nothing more than individual computers that make their storage and processing resources available to all members of the chain, to ensure that decisions on the Blockchain are made in a decentralized manner.

After the transactions have been validated, the block receives a unique identification code known as a "hash" and is then included in the chain, referencing the previous block and making it visible to the receivers of the transactions, as well as throughout the rest of the network. Each transaction is recorded in blocks with date and time information (timestamping). The information for each block in the Blockchain is summarized in its hash, with each hash referencing the previous hash, thus forming a series of verifiable and permanent data, unable to be modified without the consent of the entire Blockchain network.

Once inserted into the chain, the content of these blocks is highly unlikely to be modified. If a network user tries to modify it, the number of the original hash will be changed and will show the existence of a "new" block that does not fit in the already validated and authenticated chain.

Though it may seem complicated at first glance, it becomes simpler when we seek to understand the practical application of Blockchain.

Blockchain in practice

The first news about the use of Blockchain dates back to 2008 when the technology was discussed in the article "*Bitcoin: The Peer-to-Peer Electronic Cash System*", by Satoshi Nakamoto. This article sparked the dawn of the Bitcoin cryptocurrency, which enables individuals or entities to transact directly, replacing the reliance on intermediaries to perform or validate transactions. On that occasion, Blockchain was introduced as the technology that would serve as the basis for Bitcoin transactions on the network.

However, Blockchain's disruptive potential and its ability to serve other purposes was soon realized Currently, besides being used to enable cryptocurrency transactions in a secure and decentralized way, Blockchain is also widely used in the realm of smart contracts and tokenization of assets.

Why use Blockchain?

There are many advantages to using Blockchain, mainly due to its main characteristics of **of decentralization and disintermediation, transparency, and immutability:**

- **Decentralization and disintermediation:** cas there is no need for the approval of a central entity for the registration of transactions on the Blockchain, transactions occur directly between the parties - thus excluding them from the chain of intermediaries who could make negotiations costlier and more time-consuming.

- **Transparency:** all decisions, such as block validations and registrations, are public and visible to all members of the Blockchain, which gives greater transparency to the transactions carried out.

- **Immutability:** after the blocks have been validated by the "nodes", they become part of the blockchain definitively. Alterations to information contained in a given block can only occur through the validation and registration of a new block, without excluding the previous block. This factor makes Blockchain applications more reliable. .

The use of Blockchain provides several advantages, in particular:

- **Cost Reduction**
- **Easy Data Sharing**
- **Cutting Red Tape**
- **Reliability**

So then, why is the technology still not used on a large scale?

Notwithstanding all its advantages and benefits, there are still important challenges for using Blockchain.

While Blockchain shows agility in completing transactions, there is no way to prove the unequivocal consensus of the parties involved in a transaction, or even guarantee the quick decision-making of important decisions.

Another point of tension is the anonymity guaranteed to transact by the use of public keys instead of personal data. As users are not qualified in the system by formal identification, assigning rights and responsibilities to acts undertaken inside the network is difficult.

There is also the difficulty of controlling false information. For being an immutable tool, Blockchain does not allow the modification of its data. Although data may be rectified when a new block of information is included in the chain, the previous block will remain registered in the network.

Finally, it is difficult to determine where modifications in the Blockchain take place in the real world, which makes identifying the jurisdiction applicable to each transaction quite challenging.

These factors – especially when combined with the exclusion of traditional intermediaries such as notaries and banks –have led to distrust in the use of Blockchain by some stakeholders of society. However, the range of potential technological applications related to Blockchain tends to increase its use in the medium and long term.

BLOCKCHAIN IN THE WORLD

LOCATION	SECTOR/SUMMARY/REFERENCE
SWITZERLAND	In Switzerland, there is specific legislation on energy commercialization by consumers who have production capacity (via solar energy, for example) to other consumers through Blockchain solutions that measure the energy production and consumption to enable more efficient commercialization.
SWEDEN	Sweden has been using Blockchain technology in the real estate market since 2016 and was the first western country to begin exploring the applicatins of the technology.
ITALY	In Italy, Law No. 12/2019 created a legal foundation for adoption of technologies based on distributed ledger technologies and smart contracts and defined such technologies.
USA	According to the Internal Revenue Service (IRS), general tax principles apply to property transactions that use virtual currency.
USA (DELAWARE)	Delaware already recognizes the legality of registering corporate actions and recording ledgers on Blockchain.
ESTADOS UNIDOS (WYOMING)	The Utility Token Bill addresses ambiguity around the definition of a utility token, exempting them from the state's securities regulations, provided that (i) issuers do not market utility tokens as investments; (ii) utility tokens can be redeemed for a product or service; and (iii) issuers do not actively support the development of a secondary market for these utility tokens. The Crypto Property Tax Exemption Bill establishes that virtual currency is not subject to taxation as "property" in Wyoming, as well as conventional financial assets, money, bank balances, and precious metals, for example. The Blockchain Fillings Bill updates the Wyoming Business Corporations Act to authorize the creation and use of the Blockchain to (i) store records; (ii) identify the shareholder of a corporation; and (iii) the acceptance of shareholders' votes by the network's subscriptions.
JAPAN	Since 2016, Japan has included two extremely relevant rules on virtual currencies within its legislative framework, namely: The Payment Services Act and the Transfers Prevention Framework for Criminal Activities. The first deals with transactions with virtual currencies, establishing certain obligations, such as the need for a representative domiciled in the country, as well as annual submission of transaction records to an inspection body. The Transfers Prevention Framework for Criminal Activities, on the other hand, requires entities to verify the identity of Blockchain users, as well as transaction records, and any suspicious activity must be reported to the relevant authorities.
SOUTH KOREA	All transactions involving cryptocurrencies must be confirmed by banking institutions, under the Act on Reporting and Using Specified Financial Transaction Information. This document was created to deal with money laundering and the financing of terrorism. Among the obligations, cryptocurrency owners must answer to the country's Financial Intelligence Unit.

STUDIES AND OTHER INITIATIVES

Public Policies in R&D:

Since April 2018, the European Union, along with Norway and Liechtenstein, have created "The European Blockchain Partnership" that states that its members will work together to deliver Blockchain-based services for the benefit of citizens, society, and the economy. In addition, the European Commission launched the European Blockchain Observatory and Forum, investing €200 million in research and development projects supporting the use of Blockchain in technical and social areas.

Infrastructure:

In Europe, Blockchain has been used to guarantee in real time that both energy supplied and consumed is 100% renewable. The Spanish group Iberdrola has implemented a pilot project based on the use of Blockchain technology that even allows the enforcement of clauses of long-term energy purchase and sale contracts (Power Purchase Agreement - PPA) based on renewable assets, given that one of the requirements they establish is the need to prove the origin of the electricity supplied is 100% green.

Supply chain:

In the United States, Dole Foods has adopted Blockchain throughout its fruit processing system. At markets, consumers can check where the product they are purchasing comes from via a QR code, and get information on how it was produced.

Other American companies have also adopted monitoring of production in the food sector. IBM created the IBM Food Trust, one of several Blockchain consortia that aims to move complex food supply chains to a shared and distributed platform.

WWF-Australia and BCG Digital Ventures have launched OpenSC, a new online platform that uses Blockchain to track food and help people avoid illegal, environmentally harmful or unethical products. As WWF-Australia's first social impact venture, OpenSC recently raised more than US$4 million in capital. They are currently working to increase visibility and transparency in supply chains with familiar names such as Nestlé.

Fintechs:

In 2018, the state of Arizona created a regulatory sandbox for fintechs, pioneering the study of regulation of new technologies in the United States' financial markets, including blockchain and cryptocurrencies.

Voting in meetings:

Proxy Voting Blockchain. The use of Blockchain technology in shareholder meeting voting systems ensures greater efficiency, reliability, and security, and

facilitates the counting of shareholders with voting rights.
Meeting information is imported (agenda, date, time, etc.) to the distributed ledger and the rules of the meeting are defined through smart contracts. After meeting conditions are defined and validated, qualified shareholders are granted access to the platform where their votes are imported into the distributed ledger and encrypted in immutable registration blocks, guaranteeing the security of information. This application of Blockchain technology has already been used in Europe, North America and Asia, by institutions such as Banco Santander (Spain), Nasdaq, the ICJ and ACCESS (Singapore).

Environment:

Proxy Voting Blockchain. The use of Blockchain technology in shareholder meeting voting systems ensures greater efficiency, reliability, and security, and facilitates the counting of shareholders with voting rights.
Meeting information is imported (agenda, date, time, etc.) to the distributed ledger and the rules of the meeting are defined through smart contracts. After meeting conditions are defined and validated, qualified shareholders are granted access to the platform where their votes are imported into the distributed ledger and encrypted in immutable registration blocks, guaranteeing the security of information. This application of Blockchain technology has already been used in Europe, North America and Asia, by institutions such as Banco Santander (Spain), Nasdaq, the ICJ and ACCESS (Singapore).

Government services:

The Australian government has been a strong supporter of new technologies in the field of Blockchain and cryptocurrencies, having sent AUS$700,000 to the Digital Transformation Agency in 2018 to examine possible Blockchain applications within government services.

Regulation of exchanges:

The United States-led FATF (Financial Action Task Force) has released an updated practice guide so that Blockchain exchanges may have the same duties as traditional financial institutions. This includes identifying actors in transactions and developing processes for institutions to enforce the sharing of this information with other exchanges and authorities. There would be due diligence procedures included, such as know-your-client programs. The intention is to create a global standard of transparency.

Regulação de exchanges:

The United States-led FATF (Financial Action Task Force) has released an updated practice guide so that Blockchain exchanges may have the same duties as traditional financial institutions. This includes identifying actors in transactions and developing processes for institutions to enforce the sharing of this information with other exchanges and authorities. There would be due diligence procedures included, such as know-your-client programs. The intention is to create a global standard of transparency.

BRAZILIAN CONTEXT:

In Brazil, Blockchain can open up opportunities for entities interested in using this technology, as well as for those intending to offer it to the market as a product.

In view of the country's traditional red tape, Blockchain represents an opportunity for innovation, agility and transparency, especially by means of smart contracts, which provide security and speed for the execution of transactions between the parties involved.

There will certainly be adequate demand for Blockchain in Brazil, since several fields of the market stand to benefit from it – especially if public authorities adequately balance mechanisms to foster innovation and the development of technology.

The regulation of the technology will require the engagement of society. Public authorities can implement regulatory sandboxes and launch public consultations, allowing for the testing of new technologies in regulated sectors and enabling stakeholders to take part of the construction of a Blokchain legal framework. Some of the Brazilian regulatory authorities, such as the Central Bank (BACEN), the Securities Exchange Commission (CVM), and the Insurance Regulator (SUSEP) have been proposing successful participatory initiatives in respect to other subjects. These experiences can certainly be put to good use.

Regulatory sandboxes are environments created by regulators that allow startups and technology companies to carry out tests and experiments in regulated sectors of the market for a specific time and under regulatory supervision.

MAIN APPLICATIONS

CRYPTOCURRENCY

Cryptocurrency is a financial asset that allows electronic payment based on cryptographic evidence, thus removing the need for financial intermediaries (such as banks) to ensure its authenticity.

Cryptocurrencies are issued according to pre-established rules, publicly available in so-called white papers. The most famous white paper is attributed to Satoshi Nakamoto, who introduced the concept of cryptocurrency via the creation of Bitcoin, along with Blockchain's support architecture.

Once cryptocurrency is issued, it is the Blockchain architecture that allows the asset to be validated.

Blockchain's continuous registration works like a stamp or digital signature. It makes each cryptocurrency a unique asset, preventing duplication, and allowing it to be used in transactions like a digital currency.

Characteristics:

Cryptocurrencies possess some particular characteristics that make them different from traditional currencies. **Decentralization** is fundamental to cryptocurrency, and is present in the creation, transfer, and maintenance of cryptocurrencies.

Cryptocurrencies are independent of central banks, and the amount in circulation can be increased by any person or group that follows the pre-established rules for their issuance in white papers.

A cryptocurrency transaction is a **direct transaction** between two users (peer-to-peer), thus their use as an instrument of exchange does not depend on a central verifying agent. Transactions can be validated by any of the points in the Blockchain network, which act as verifying agents and generate the necessary consensus for transactions to be completed and recorded within the structure.

Just as with the issuance and transfer of cryptocurrencies, there are no central institutions with an exclusive prerogative for cryptocurrency storage. Some software options – so-called "wallets" – provide means for creating and securing cryptocurrencies that can be stored either in the cloud, or offline on physical media.

Due to the absence of intermediaries, **cryptocurrencies are international in scope**, with no conversion rates for different countries, or fees for international transactions. Transactions are not restricted to bank hours - the concept of a "business day" is not applicable to cryptocurrencies.

So that decentralization does not harm the reliability of cryptocurrencies, another of its notable characteristics is **transparency.** Every detail of each transaction that occurs is duly registered in the Blockchain network, through its chain of interconnected blocks, forming a large accounting book available to multiple participants. This permanent, multi-faceted record raises the level of **security** for cryptocurrencies, away from forgery, transaction fraud, theft, and robbery.

Although cryptocurrencies are decentralized by nature, how agents will use them and their application in society are subject to constant evolution and regulation in several jurisdictions around the world. News reports from countries that have started to regulate the circulation of cryptocurrencies – such as Japan and Switzerland – are recurrent. Thus, depending on the country, **cryptocurrencies can be banned, regulated as currency, or considered as intangible assets**, liable for commercialization without any regulation from monetary authorities.

Mining

Mining is the method by which a cryptocurrency is traditionally issued. Despite its name, the process does not relate to any ores or minerals, rather consisting of a process for solving complex mathematical problems. "Miners" invest time and computing capacity to solve such mathematical problems, which involve verifying transactions carried out through Blockchain's structure.

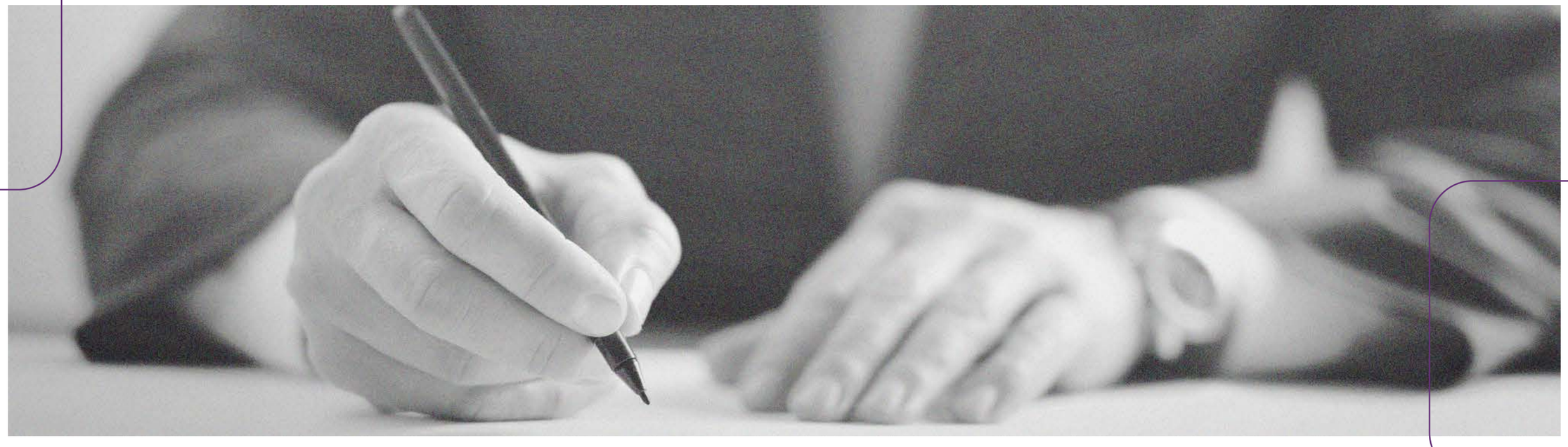
The term "mining" is used in comparison to the work of miners to obtain gold, in the sense of it being extracted and then circulated. In the case of digital currencies, once the mathematical problem has been solved, that is, once the computational effort and the work to achieve the result have been demonstrated, the miner is awarded with cryptocurrency, duly registered on the Blockchain network.

Initial Coin Offering - ICO

ICO (Initial Coin Offering) is the term adopted to refer to what is essentially an IPO (Initial Public Offering) for cryptocurrencies. However, unlike what would happen in a traditional IPO – where a portion the capital raised would be attributed to an investing shareholder, providing a certain amount of money – the ICO aims to raise funds through public funding in exchange for fractions or cryptocurrency units offered.

It is a procedure that is still awaiting specific regulation, but some central aspects must be taken into account:

- **White paper** - consistent with the description of the ICO's scope, with an explanation of the related technology behind it.



- **Credibility/Team** - it is important to note who is behind the ICO and investigate its history, in order to give the ICO greater credibility.

- **Liquidity** - attention should be paid to how the newly minted cryptocurrency will be used after the ICO has finished.

One of the most successful examples of an ICO is the Ether cryptocurrency, the currency of the Ethereum platform used to create new cryptocurrencies, which raised approximately US$18 million from its ICO in 2014.

Cryptocurrency Options:

There are thousands of cryptocurrencies available, with the main differences being **(i)** market value, **(ii)** form of distribution, **(iii)** transaction speed, and **(iv)** algorithms used. The creation method and the structure (*Blockchain*) that support them are usually the same.

Bitcoin – the precursor to all other cryptocurrencies – remains the most popular one with the highest market value, with all other currencies that have followed on thus known as altcoins. Ether has become very relevant among these altcoins due to the Ethereum platform, developed not only to serve as a model for cryptocurrency but for several other purposes such as smart contracts and tokens.

SMART CONTRACTS

Smart contracts were well defined by Nick Szabo in 1996 as "a set of promises, specified in digital form, including protocols within which the parties perform on these promises"[1]. In other words, they can be understood as lines of code that are stored in a Blockchain and are automatically executed when their predetermined conditions are met.

Although old, this definition remains compatible with what is understood by smart contracts today. Through this definition it is possible to reflect on the technical, business, and legal developments of this technology.

- **Set of promises**: They may have been contractual – characterized as terms or rules of operation – or non-contractual, depending on the smart contract model, as will be discussed later.

- **Digital form**: This is related to the fact that the smart contracts operate electronically through lines of code and software that prescribe certain conditions and consequences. The contractual clauses and/or functional consequences are described in the form of codes in the software, and the entire procedure is carried out digitally.

- **Protocols**: Computational protocols in the form of algorithms constitute a set of rules for which each party must process data in relation to a smart contract. It is the mechanism that performs the qualifications and basic rules of the transactions, and

1 "[...] a set of promises, specified in digital form, including protocols within which the parties perform on these promises." - Nick Szabo, Smart Contracts: Building Blocks for Digital Markets, 1996.

allows the execution of actions such as making payments.

- **Pre-established promises**: Self-enforcement is one of the central points of these contracts. Because they are traditionally stored in a Blockchain, their clauses are automatically enforced, and the effects of their predictions are unlikely to be avoided once underway.

Unlike traditional contracts, where a third-party describes the terms and writes the document, with smart contracts, the terms can be developed physically, or through an electronic platform, and can be implemented and signed in a digital manner that is secure and transparent for all parties. Thus, smart contracts inserted in a Blockchain have the ability to simplify interactions between parties in a given transaction or business activity, leading to transactions based on pre-established and automatic commands.

It is important to note that there are a variety of smart contract forms, which can be: **(i)** fully coded, **(ii)** a contract with one coded version and another in natural language; **(iii)** a combination of contract with natural language, with codified enforcement; or **(iv)** a natural language contract with an encrypted payment system.

Despite this variety of forms, all smart contract models involve coding. The operation of this technology is based on cause and effect ("if/when/then"), which are encoded in a Blockchain. When particular conditions are met and verified, computer networks perform the actions called for in smart contracts, updating the contract history while being registered in the chain.

With such objectivity, smart contracts present several benefits, such as: **(i)** speeding up transactions and saving time related to inaccuracies and corrections in contractual wording; **(ii)** increasing the confidence of parties involved in a transaction, as all conditions are automatically executed in accordance with predetermined rules, and encrypted records of transactions are created and shared with all participants.

Examples of possible applications for smart contracts are:

(i) **Insurance contracts:** the parameters of an insurance policy can be coded in a smart contract and enforced automatically. A certain policy may provide for automatic payment of a specific amount of insurance coverage as a result of a certain event, without the need for an administrative process to ascertain what took place (if X occurs, then the insured will receive Y);

(ii) **Escrow:** smart contract protocol retains funds until the occurrence of a certain event and the verification of a message. Once the event has occurred and the content of the message has been observed, the contract protocol automatically enforces a contractual action such as the payment of a certain amount to the beneficiary.

(iii) Royalties Distribution: automatic payment of royalties according to a certain event.

Despite these positive prospects, smart contracts are the result of coding and may contain defects and/or not correspond to parties' initial plans. Command transmission can be hampered by network instability, and there is a risk that encrypted keys will be hacked. In addition, the automation of some contracts becomes more complex as we face situations such as the reversibility of transactions, subjective analyses, complex principles (such as reasonability), and many other interactions between Blockchain structures and external information.

Therefore, while smart contracts have positive prospects and may be able to reduce costs and make contractual relationships less unstable, they are not necessarily exempt from errors and difficulties that may arise in new ways – something typically found in technological contract mechanisms.

SMART CONTRACTS AND THE INSURANCE MARKET:

Smart contracts could have several functions in the insurance market, including the automation of risk underwriting and claim regulation.

In the risk underwriting process, a smart contract can be used for the insurer to issue an insurance policy if certain requirements are established. For example, a customer seeking protection for robbery and theft of a smartphone could include their personal data and data about the smartphone to be protected (brand, model, IMEI) in the Blockchain; such data would be validated (by means of external checks and/or in the Blockchain itself) and if certain conditions are subsequently met, the smart contract could automatically generate an insurance policy for such an asset, all without human interference.

Another application of smart contracts occurs in the claims regulation process, being especially interesting in the case of parametric insurance. In parametric insurance, the regulation of the claim does not depend only on the verification of the damage caused to the insured asset (such as the analysis of damages to an asset in an automobile accident), but also on the verification of certain parameters. There is also climate-linked parametric insurance, in which the payment of indemnity is due if a certain meteorological event occurs (number of dry days, frost, volume of rain, etc.), and parametric insurance that provides for the payment of indemnity in case of delays on flights. In those cases where claim regulation depends on the verification of certain parameters, smart contracts can be widely used to verify these with external sources and, once verified, to adjust the claim and pay the compensation very quickly. This could even be done with the aid of data automatically transferred to the Blockchain using equipment that has incorporated IoT functionality.]

SMART CONTRACTS AND THE IP MARKET

Within the universe of intellectual property, these contracts could be used to quickly fulfill the assignment or licensing of a certain asset between the parties, when negotiated in a simplified manner. The moment any of the established conditions are met, the obligation corresponding to the other party is automatically fulfilled.

An example of a smart contract used in the music industry came with the emergence of the Choon streaming platform[2] in May 2018. The idea behind the launch was to enable independent artists to launch their productions on the market and directly manage their copyright and receive payment (via cryptocurrency) for the reproduction of their music. However, the artists' remuneration varied significantly due to the fluctuating cryptocurrency financial market. From the analysis of cases like this, new platforms have already been launched on the market with different guarantees and the tendency is that more and more players are fighting for space in the entertainment industry[3], already known by some as "Industry 4.0"[4]. The tokenization of IP assets has already been discussed by the World Intellectual Property Organization (WIPO) and its applicability may be directly connected with the enforcement of smart contracts, further accelerating transactions and favoring automation.

2 Choon - A Music and Digital Content Ecosystem Utilizing Smart Record Contracts, Choon White Paper. Available at: https://www.choon.co/public/pdf/choon_whitepaper_v1_07.pdf. Source: https://www.kryptographe.com/top-5-best-blockchain-based-music-streaming-platforms/. Accessed on: June 1, 2020.

3 As an example, there was the launch of the Mycelia platform by Imogen Heap, Grammy winner in categories such as best singer and best lyrics. According to the British singer, the goal behind the development of this project is to empower a fair, sustainable, and digital environment for the music industry through the blockchain. TAPSCOTT, Don; TAPSCOTT, Alex. Blockchain Could Help Artists Profit More from Their Creative Works. Available at: https://hbr.org/2017/03/blockchain-could-help-artists-profit-more-from-their-creative-works. Accessed on: May 28, 2020.

4 ROSSOW, Andrew. How Can We Make Intellectual Property Rights 'Smarter' With The Blockchain? 2018. Available at: https://www.forbes.com/sites/andrewrossow/2018/07/24/how-can-we-make-intellectual-property-rights-smarter-with the-blockchain/#579e785785ec. Accessed on: May 29, 2020.

TOKENIZATION

Tokens are security devices that generate unique, exclusive, and random digital identifier codes. The transformation and individualization of data or assets in a token is called "tokenization", and has several applications, as we will see below.

In the payment industry, tokenization is a security mechanism in which the complete data on a credit card, for example, is replaced by a token at random. Thus, all entities participating in the payment chain share only the token with each other, so as to not distribute the data on an individual basis and to guarantee an additional level of security for the cardholder. Even if a security incident occurs, the attacker will not be able to revert the token to bank details, which could potentially cause great damage to the cardholder.

There are also utility tokens, a kind of unregulated digital asset that enables transactions in an online environment. Via this instrument, interested parties can exchange tokens for products or services in a limited context.

It is possible to make a comparison between utility tokens and tokens from an amusement park – the tokens from a park are issued and can only be used within that park, and it is not possible to use them at a competitor's park or anywhere else. Likewise, issued utility tokens will only work for the specific purposes determined by a particular company or entity. This guide will however focus on the process of tokenization with the application of Blockchain technology, known as the "security token", which aims to cut red tape and speed up certain everyday transactions.

Through the Blockchain structure, it is possible to "tokenize" real assets, in a process of converting all or part of assets into a certain number of tokens, depending on their value, such process being registered, moved and stored in the Blockchain architecture.

The assets to be converted into tokens can be numerous: works of art, company shares and part of a property are just some examples that can be converted into one or multiple tokens and traded around the world. In this way, the token digitally represents a fraction of the value of that asset in the market and can be traded. This negotiation is commonly associated with smart contracts.

So, how does this work in practice? Imagine that a property owner intends to sell such property. The owner can either carry out the sale in the traditional way – negotiating with a single buyer – or he/she can tokenize such property. In this case, the owner will be able to issue numerous tokens for a given unit value (at the owner's sole discretion), in an environment linked to the Blockchain's structure. Once issued, the tokens and the fractions they represent can be sold to several individuals at the same time,

and each of these individuals will hold a percentage of the ownership of the property.

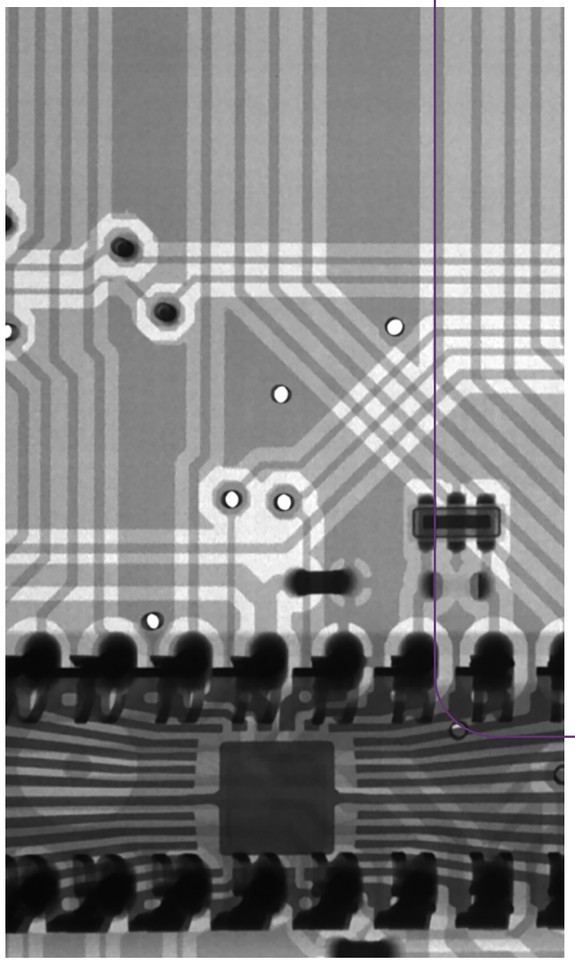
In the same vein, some companies are issuing debt securities using Blockchain technology, with each token representing an issued security. Considering that Blockchain is an immutable technology, the tokenization of the property or debt security will be permanently registered.

Some advantages of **tokenization in Blockchain** are described below:

- **Enables the opening of the market:** considering that tokenization allows an asset to be divided up into millions of tokens, a greater number of people can acquire or invest in it. For example, traditional marketing of artworks regularly reaches a limited audience, since only individuals with a large purchasing power have access to this market. However, if a painting is divided into several tokens, several people can acquire fractions of ownership rights over the painting at the same time, for drastically less than the total value of the asset;

- **Cutting Red Tape:** as in other applications of Blockchain technology, tokenization is yet another example of optimizing a process by cutting red tape considering that all issuance, negotiation, and registration is carried out on Blockchain technology, without intermediaries.

- **Despite these advantages** (as well as those derived from other common applications of Blockchain technology) tokenization faces several legal challenges, especially in highly regulated markets that have rules for negotiating and formalizing the transfer of assets and goods.



TOKENIZATION AND INSURANCE MARKET

Tokens could be used by the insurance market in a diverse array of forms. The use of cryptocurrencies and security tokens in the insurance market depends on their regulation by the Brazilian Central Bank and the Brazilian Securities and Exchange Commission, as these are matters under their jurisdiction. On the other hand, there is no impediment for the insurance market to make use of utility tokens right now. Utility tokens can be sold to finance certain projects, giving their holders the right to use a certain product or service in the future. For example, an insurance marketplace could sell utility tokens for a certain price and guarantee acceptance of that utility token in the future as payment for an insurance premium greater than the original cost of acquiring the token.

TOKENIZATION OF REAL ESTATE

Tokenization of real estate is recent and with no specific legislation in Brazil. Depending on the real estate tokens' form of issuance and the rights granted to investors, they may be characterized as securities. They would thus be regulated by the Brazilian Securities and Exchange Commission, which has already been analyzing the matter more closely. Tokenization would reduce intermediaries and the costs involved in real estate transactions by reducing inconsistent information and increasing transparency in regard to third-party actions. To make tokenization public and ensure its legal validity and effectiveness, it must be carried out by splitting the rights as established in a public deed and filed at a relevant real estate registry. Notary services are also still essential for providing legal certainty to property as an investment asset, as these notaries act as custodians of the goods or rights that are divided up and transformed into digital assets (tokens).

ENVIRONMENTAL

Addressing complex environmental problems has become increasingly necessary in Brazil, and at a domestic level there are the legal guidelines that govern activities on Brazilian soil. More importantly, however, is the international system that demands transformation in governance structures, models of investment and socioeconomic engagement in adopting a more sustainable way of life.

The possibilities of applying Blockchain in environmental matters are growing as the world continues to search for more sustainable development models. Tools found in Blockchain technology provide possibilities for the proper traceability, security, transparency and the allocation of environmental responsibilities derived from economic activity and operations.

Common uses of Blockchain in environmental matters:

Given its intrinsic characteristics of transparency and traceability, Blockchain has already been used in the **supply chain**[5] to track food and provide the population with information on its origin, production control and quality. The system can track the extraction of raw materials, management of suppliers and branches, production control and transportation of associated waste to its final destination, along with a potential reverse logistics system, bringing greater transparency to **waste management**[6]. Companies can therefore increase control over their environmental management and consumers are able to validate the information that the company provides regarding the product life cycle.

Brazil has examples of platforms that use Blockchain and machine learning to track environmental assets, such as maintaining and preserving forests, water resources and **biodiversity**[7]. In the case of products originating from Brazilian biodiversity, Blockchain is able to provide traceability, transparency, and security along the supply chain. This is because the species subject to technological research and development, derived products and their associated commercial value are all included in a digital platform by suppliers. Together with the implementation of smart contracts, this type of technology guarantees to the interested parties that they are compensated fairly and equitably, as it also provides information related to the proper sharing of benefits.

5 Within a company's monitoring system, suppliers include information about the products and services provided, information that is validated in the subsequent stages of the chain, up to the final stage, in which information about the final destination of the waste and eventual reverse logistics system are included. Information on the regularity of suppliers, such as the indication of which licenses and environmental authorizations they have, can also be included to facilitate environmental management by the company.

6 https://plataformaverde.com.br/?gclid=CjwKCAjwh472BRAGEiwAvHVfGlxQHgolqpHt1gUbWYUJWTfSufpZf01Pcg2PPlzfxOJFwaR8LUhoCARMQAvD_BwE

7 https://nacoesunidas.org/brasileira-cria-tecnologia-que-rastreia-biodiversidade-utilizada-produtos/

Blockchain technology can even be used in the context of **carbon credit tokenization**. It is possible to create a network platform for companies to easily and efficiently compensate their carbon emissions, as the tokenization of carbon credits allows them to be sold or exchanged, similar to the idea of a digital currency. Carbon-neutral products and services are thus encouraged by the facilitation of these operations[8].

In other countries this technology has already been used to ensure that energy supplied to certain locations is 100% renewable. Blockchain facilitates compliance with contractual clauses that require proof of the 100% sustainable origin of the electricity supplied.

HOW CAN WE HELP?

In light of the growing demand for more sustainable organizations, products and services, Blockchain technology has arrived at the environmental universe ready to revolutionize sustainability-related legal transparency and security in business. Therefore, it is essential entities to be advised about the implementation of the technology, ensuring high-quality information checks for data that will be sent to the Blockchain system, as well as an excellent and thorough implementation throughout all stages, considering any necessary procedures and any applicable regulations.

In this sense, we can assist in **(i)** identifying opportunities for the use of Blockchain in a company's environmental management; **(ii)** verification of the environmental information that must be included in the Blockchain system under the terms of the applicable environmental legislation; **(iii)** legal advice on the programming of smart contracts, in order to reflect the application of environmental regulation; and **(iv)** environmental auditing of projects capable of generating tokenizable assets, as well as providing legal advice on the transactions involved.

8 https://www.carbonx.ca/

COMPLIANCE AND CORPORATE ETHICS

Blockchain's versatility has been used in the corporate environment in different ways, including as a tool for structuring, implementing, and monitoring compliance programs, such as:

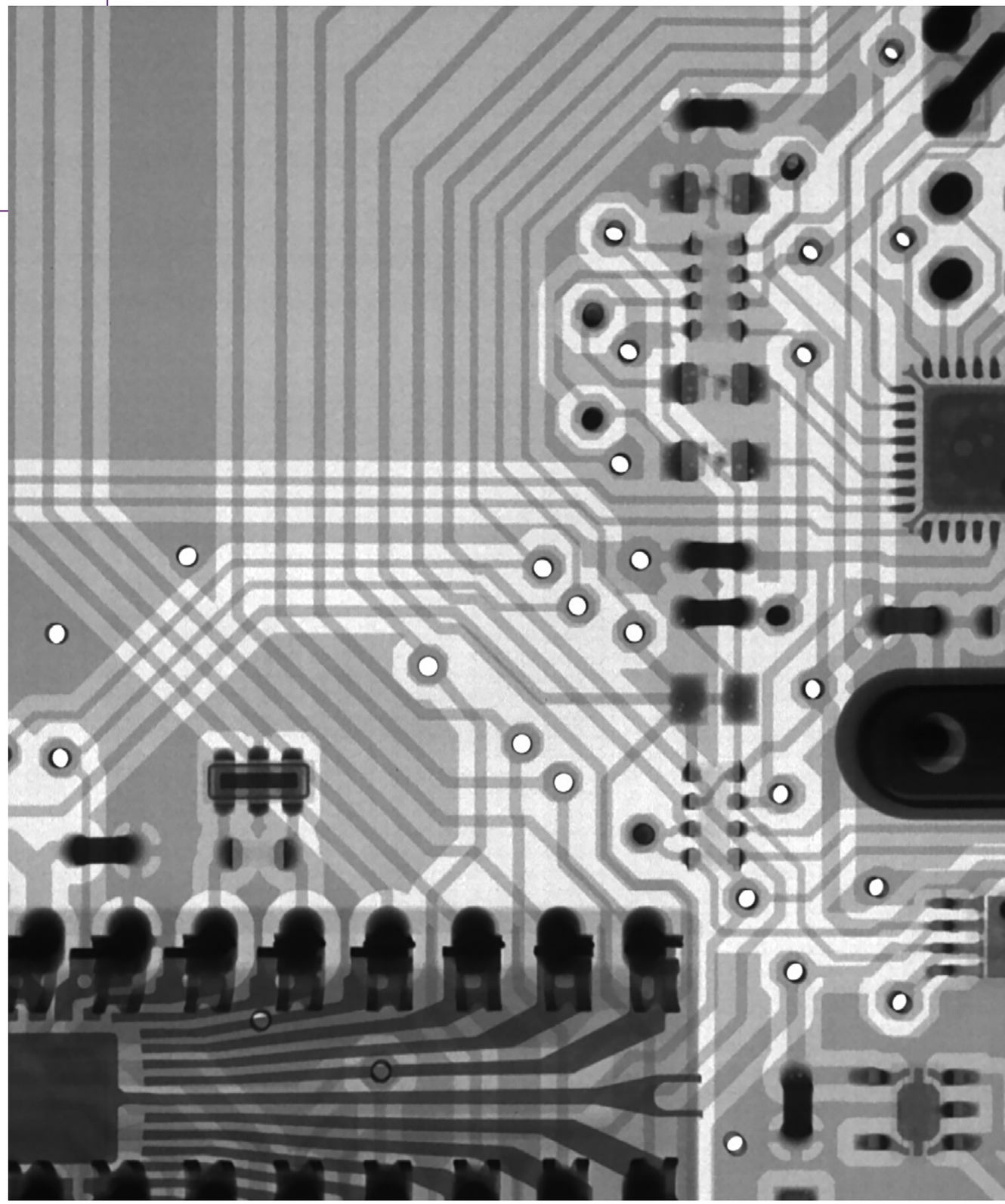
- **Audits:** With the automation of companies' internal risk management controls, Blockchain can facilitate the creation of audit trails for internal compliance verification and create risk maps broadly and securely.

- **Internal investigations and supervisory administrative procedures:** as the information in the Blockchain chain is immutable, all changes to the history of a digital asset are recorded.

- **More efficient management:** Blockchain's automation and synchronization capacity allows for automatic measuring of the efficiency of companies' compliance management.

- **Efficiency gains:** companies can experience significant efficiency gains. As all changes made to the information block are permanently registered, the resulting traceability means that the technology can be used for the validation and certification of documents, contracts, which places it as a future substitute for traditional notaries.

In spite of the lack of regulation in most countries, the characteristics and versatility of Blockchain technology make it an important tool for companies looking to maintain their integrity. Be that as it may, companies must have an effective and pre-existing compliance program for Blockchain to make a difference. After all, Blockchain does



not replace integrity standards. Instead, it facilitates the measurement and implementation of monitoring controls for those standards. In this sense, it is essential that companies adopt integrity policies, codes of ethics and conduct, undertake employee training, create reporting channels and other control and disciplinary measures.

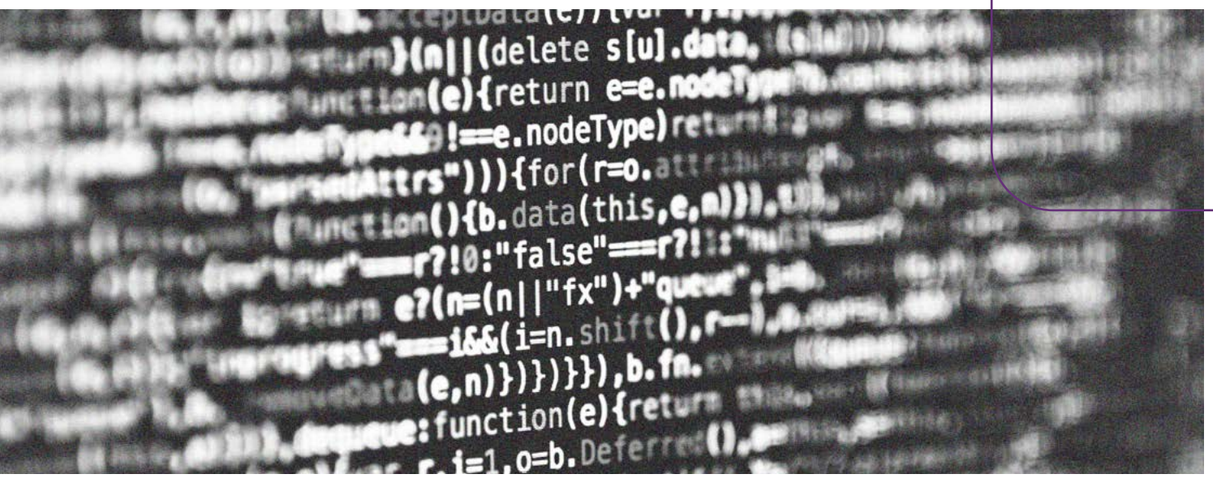
The use of Blockchain technology has an enormous potential to strengthen and refine internal procedures for integrity, for auditing, for encouraging the report of misconduct and for the effective application of codes of ethics and conduct within companies. All of these factors are mentioned by the Anti-Corruption Law as indicative of an effective compliance program.

Thus, the use of Blockchain technology in companies may prove to be a very positive element in the event of an evaluation of compliance programs, either to attest to the credibility and efficiency in programs such as Pró Ética, or in the event of an administrative proceeding or leniency negotiation.

HOW CAN WE HELP?

- Elaborating codes of conduct and integrity policies that consider the use and storage of information in Blockchain;
- Review of companies' compliance programs if they intend to benefit from Blockchain through smart contracts;
- Advice on internal investigations whose results are stored in Blockchain;
- Advice on the implementation of Blockchain as a tool for monitoring risk maps;
- Advice on the implementation of Blockchain as a tool for reputational analysis of clients and business partners;
- Advice on administrative proceedings that require analysis of documents encrypted with Blockchain technology;
- Drafting reports and risk mapping about the implementation of Blockchain in companies in their integrity policies.

ANTITRUST



When considering the possible interactions between antitrust law and Blockchain technology, the following aspects stand out:

- **Constitution of a consortium or joint ventures to explore Blockchain technology may be subject to mandatory filing to CADE** (Administrative Council for Economic Defense): the formation of consortia or joint ventures, and the signing of associative contracts for the implementation and exploration of Blockchain platforms/technology that satisfy the following criteria will be mandatory for CADE: (i) the consortium or joint venture is constituted or has activities in Brazil; and (ii) if the groups involved in the operation fulfill revenue criteria in the year prior to the formation of the consortium (i.e. one of the groups registered a minimum of BRL$750 million, and the other group registered a minimum of BRL$75 million in gross revenues).

- **Risk of collusion/cartels:** If all companies in the same market use the same Blockchain platform/technology, there is a risk of competitively sensitive information flow between competitors (such as costs and prices of products or services). This can not only facilitate collusive behavior among the competitors in question, but also monitoring of deviations from cartel participants.

- **Risk of abuse of a dominant position by refusing access:** If a Blockchain platform becomes essential for activities in a certain market, the unwarranted refusal of access to that platform may have the potential to exclude or prevent the entry of new competitors.

- **Risk of market closure through technical standardization:** The use of Blockchain technology can facilitate agreements on technical standards applicable to platforms. Such agreements can be pro-competitive because they create compatibility/interoperability between systems of different companies, but they can also prevent the entry of new competitors and consequently have the potential to close off the affected markets.

- **Facilitation of market and remedy monitoring:** Competition authorities can use Blockchain platforms to identify suspicious activities in markets and ensure that they are able to monitor any imposed remedies in relation to conduct and structure control – for example, through "memorization" and automatic execution of smart contracts.

HOW CAN WE HELP?

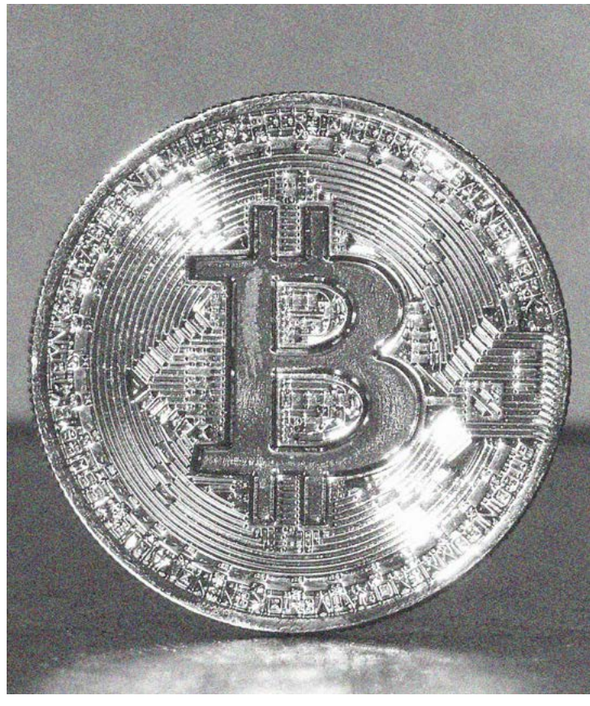
Our Antitrust practice area can assist clients throughout the technology creation, implementation and granting of access to Blockchain technology stages, including:

- Representing companies in regard to merger control filingsinvolving the formation of consortia for the use of Blockchain technology;

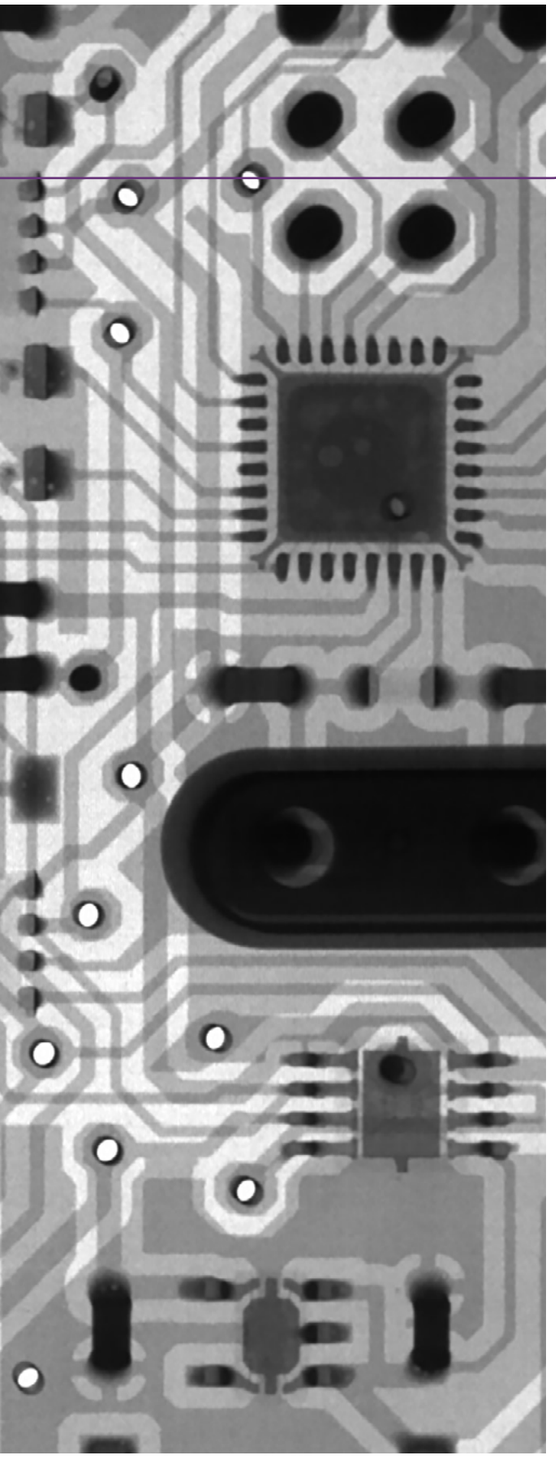
- Advice on the creation and implementation of Blockchain platforms/technology to ensure that they are in compliance with antitrust law, and recommendation of mechanisms for mitigating associated risks;

- Representing companies in regard to administrative proceedings before CADE, when investigating alleged anti-competitive behavior related to the use of Blockchain technology; and

- Acting in relation to antitrust matters before the Brazilian Central Bank and other authorities that may be created to regulate markets that use platforms with Blockchain technology.



LITIGATION



JUDICIALIZATION OF TECHNOLOGY IN BRAZIL:

THE INTERPRETATION OF TECHNOLOGICAL INNOVATION BY THE JUDICIARY AND POSSIBLE IMPACTS ON SMART CONTRACTS AND CRYPTOCURRENCIES

Technological innovations change living standards and raise new social and economic dilemmas. Naturally, differences between users, suppliers, and control and inspection bodies arise during this process.

Brazil is a country with a highly litigious tradition and these debates are invariably taken to the Judiciary. This has happened with private transport applications, cryptography, internet service providers' liability for third-party content, and even with electric scooters. It could therefore happen with smart contracts and cryptocurrencies too.

Below, we present the general characteristics of three distinct phases of this litigious process resulting from technological innovation, and how it can impact the use of smart contracts and cryptocurrencies in Brazil:

IMPLEMENTATION PHASE

FASE DE IMPLEMENTAÇÃO	FASE DE REGULAÇÃO	FASE DE CONSOLIDAÇÃO
• Little or no standardization; • Little or no interpretation by the Courts regarding the application of the new technology; • Economic agent with greater freedom for development, but with greater inherent risks; • Strategic moment for the definition of understanding by the courts: few cases become a paradigm for future understandings; • The responsibility of internet platforms for third-party content[9], for example, was first established by precedents and later standardized by the "Marco Civil da Internet" (Brazilian Civil Rights Framework for the Internet).	• Attempts to regulate by the Legislative Branch or sectoral bodies; • Conflict of case law of the Brazilian courts; • Faced with an eventual conflict of case law or excessive regulation, the debate can be taken to the Supreme Federal Court, such as in regard to: - Illegality of laws restricting individual transport applications[10]; - Illegality of decisions that block messaging applications[11].	• Once the legality of services has been established, with a final decision or regulation of the topic, the litigation is no longer about the regulation process and focuses on the use of innovation by consumers and users; • In the case of smart contracts, the solution to issues between parties can be defined; - Brazilian Civil Code: immutability and self-enforcement of the contract with coding errors or problems of expression of will. • In the case of cryptocurrencies, solutions can be defined for issues such as: - Responsibility of brokers and Blockchain platforms; - Legal nature and which bodies are responsible for inspection and regulation.

9 Marco Civil da Internet (Lei n. 12.965/2014), art. 19, caput.
10 STF, RE 1054110 RG, Justice Roberto Barroso, judged on Dec.12, 2017.
11 STF, ADI 5527, Justice Rosa Weber, judgment pending.

PRECEDENT OF THE STATE OF SÃO PAULO COURT OF APPEAL

After having an online purchase frustrated twice, the marketplace platform blocked the plaintiff's account because it understood there were signs of fraud[12]. According to the court, despite being a smart purchase and sales contract, the "fundamental notions and categories to Private Law" apply. So, the plaintiff cannot claim for damages due to emotional distress for the blockade, as it agreed to this possibility by agreeing to the terms of use of the platform.

- **In the case of fraud in a digital account that caused a loss of bitcoins, the court decided that the brokers were liable for supervening causes that go beyond the natural risk of the investment[13].**
- **In the case of non-compliance with clauses in trading contracts, it determined the payment of moral damages for the non-fulfillment of the brokerage contract by the broker[14].**

- **In the case of fraud in a digital account leading to the loss of bitcoins, the Brazilian Consumer Protection Code was applied to the relationship between the broker and the contracting party[15].**

PRECEDENTS OF THE SUPERIOR COURT OF JUSTICE

- **In the case of contracting bank account services, it was considered possible for banks to unilaterally terminate the contract with prior notification[16], given that the purchase and sale of cryptocurrencies is not a regulated service in Brazil.**
- **In the case of an analysis of which court (Federal or State) should have jurisdiction over crimes related to the public offer of collective investment contracts in cryptocurrency, it was acknowledged that the transaction involving the purchase or sale of cryptocurrencies is not regulated in Brazil[17].**

How have the courts ruled in Brazil?

Brazilian precedents on smart contracts and cryptocurrencies are scarce and limited to matters that have little to do with technological innovation itself.

Smart contracts

As this technology is not widespread in Brazil and lacks specific regulation, the courts have interpreted smart contracts using basic contractual concepts provided for in the Brazilian Civil Code: good faith between parties, respect for the terms of the contract, respect for the allocation of business risks, social function of contracts and civil liability.

Cryptocurrencies

There is a tendency to protect investors in cases where brokerage contracts are breached, with the awarding of damages due to the mismanagement of assets, the non-transfer of dividends or the security flaws within the platform.

HOW CAN WE HELP?

As there is no specific legislation and there are only few decisions, sensitivity and legal precision are required in the use and creation of these tools. Mattos Filho's Litigation and Arbitration practice area works on the most complex national and international cases with clients in the technology sector. Our professionals remain up to date with the most current debates in the sector and their legal implications, in order to offer adequate and safe solutions to issues arising from innovation processes.

Cybersecurity relates to the need to ensure the continuity and protect the

12 The purchase and sale contract, in this case, is a simple smart contract - the interested party pays the value of the product and the enforcement of the contract is automated by the platform. TJSP, Apelação n. 1017332-26.2018.8.26.0068, Appellate judge. Artur Marques, judged on Jan. 28, 2016.

13 For cryptocurrencies, there is no need for a third intermediary for transactions. Thus, the service would be used to increase financial transactions, with the Brazilian Consumer Protection Code (CDC) not being applied. STJ, Resp n. 1.696.214-SP, Justice Marco Aurélio Bellizze, judged on Oct. 09, 2018.

14 This is because "virtual currencies are not considered by the Central Bank of Brazil (BCB) as currency, nor are they considered as securities by the Brazilian Securities and Exchange Commission (CVM) ". STJ, HC n. 530.563-RS, Justice Sebastião Reis Júnior, judged on Mar. 5, 2020.

15 It was considered to be the broker's liability to protect the user from fraud in his digital account, either on the internal network or that of on its computers; TJSP, Apelação n. 1035890-47.2018.8.26.0100, Appellate judge. Flavio Abramovici judged on Jan. 28, 2016.

16 TJSP, Apelação n. 1006504-35.2018.8.26.0176, Appellate judge. Morais Pucci, judged on Feb. 11, 2020.

17 TJSP, Apelação n. 1030080-87.2018.8.26.0554, Appellate judge. Jonize Sacchi de Oliveira, judged on Oct. 24, 2019.

CYBERSECURITY

existence of electronically-stored data, communication networks and critical infrastructure from illegal use, access, or interference. It aims to ensure confidentiality, integrity, data availability and communication networks.

The development of new technologies such as Blockchain may allow companies to develop controls and systems to reduce cyberattacks and associated risks. Blockchain can incorporate security mechanisms to make the cost of the breach or attack exceed potential rewards.

However, Blockchain does not offer an impenetrable solution to all cyber risks and, like other technologies, it must include system and network cybersecurity controls, due diligence and best practices and procedures. Security incidents that permeate Blockchain can range from service interruptions to robbery of sensitive data and cryptocurrencies.

Blockchain's most common risks include but are not limited to:

(i) software coding errors;

(ii) vulnerabilities of operating systems and platforms (e.g. hardware and software);

(iii) vulnerabilities of end-users, exploiting vulnerabilities in connected systems (e.g. stolen private key, attacks on online wallets), and unauthorized impersonation of Blockchain users.

As no 100% secure information system exists, companies that use or intend to use Blockchain must adopt cybersecurity controls, standards, practices, and policies to protect the organization from cyberattacks.

For the design and implementation of adequate cybersecurity governance, companies must:

(i) identify the laws and regulations applicable to each specific sector, as well as the best international practices and standards;

(ii) perform risk analyses applicable to processes, people, systems, and suppliers, which must be periodically reviewed and updated;

(iii) develop a plan to respond to potential cyberattacks, including notifying authorities and individuals;

(iv) implement adequate management of suppliers, including due diligences, policies, processes, contracts and audits;

(v) Increase awareness and conduct training of employees, executives, and suppliers;

(vi) implement organizational, technical, administrative cybersecurity measures, policies, and processes;

(vii) implement measures to prevent, test, and monitor vulnerabilities to potential cyberattacks;

(viii) implement security measures (e.g. encryption);

(ix) constantly evaluate and adjust internal procedures; and

(x) contract and maintain cybersecurity insurance.

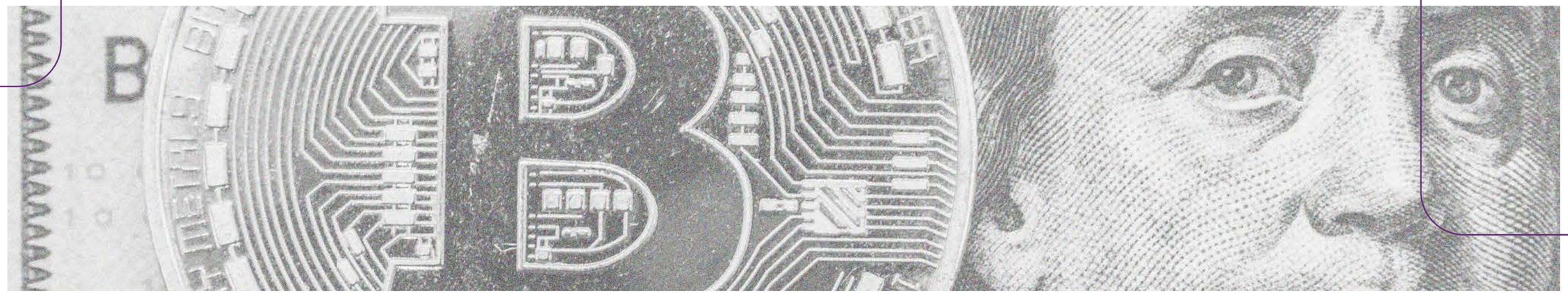
The lack of adequate cybersecurity governance in the Blockchain system can lead to negative impacts, such as financial and reputational damages, the application of fines and sanctions, indemnities, and possible individual or collective legal actions.

"Hackers exploited an error in the code of the Decentralized Autonomous Organization (DAO) – a capital investment fund managed via smart contracts – allowing them to carry out repeated attacks and diverting around 3.6 million Ether (approximately USD 55 million)."]

HOW CAN WE HELP?

- Legal advice regarding data breaches and cyberattacks;
- Assistance in the development of preventive measures related to security incidents;
- Development of internal processes to adequately respond to cybersecurity incidents related to data subjects, authorities, and other third parties, including preparation in regard to people, processes, technologies, and information reports;
- Development of cybersecurity and other corporate policies to regulate personal data processing;
- Team training on best practices and cybersecurity measures;
- Assistance in the development of educational materials for employees, third-party service providers and other collaborators, focusing on cybersecurity issues;
- Conducting internal cybersecurity training;
- Consultancy and legal advice on the relationship between data processing agents and data subjects that are processed using Blockchain technology;
- Preparation and review of contracts and documents involving the contracting of third-party Blockchain technology service providers who collect or process personal data for the benefit of the company;
- Legal advice and cyber insurance review – important tools in a company's cybersecurity program, covering risks that cannot be practically prevented or reduced.

INVESTMENT FUNDS



Similar to the other areas covered in this guide, distributed ledger technologies (DLT) could potentially have an enormous impact on the investment fund industry, whether in supervisory activities performed by the Brazilian Securities and Exchange Commission (CVM) or by investment fund service providers.

Through the Regulatory Activities Information Integration Platform (PIER), announced on April 1, 2020[18], the CVM will adopt a DLT system-based platform for the exchange of information with the Brazilian Central Bank (BACEN) and the Brazilian Insurance Regulator (SUSEP). Through this technology, the platform records data relating to its use, mitigating improper access to available information and to its consultation history. The expectation is to optimize the cost of regulatory compliance by reducing redundancies in requests for information rearding regulators and capital markets participants in general.

Furthermore, on June 1, 2020, the CVM enacted the Instruction No. 626, which provides for rules regarding the constitution and operation of a regulatory sandbox in the Brazilian capital markets. By granting authorizations for certain participants to test innovative business models, the sandbox opens an opportunity for the study of the application of DLT systems to the investment fund industry, together with the CVM.

The CVM's initiatives are in line with what has been observed in pioneer countries.

In 2018, the US Securities and Exchange Commission (SEC) declared its support for the innovation agenda and for the adoption of new technologies such as digital tokens, acknowledging their benefits to the investment fund industry. Such operations may take place as long as they, among other obligations:

(i) are properly registered;
(ii) comply with the applicable rules; and
(iii) are reported to the SEC whenever necessary[19].

The so-called "tokenization" of assets, a process of issuing a security token that digitally represents a real and negotiable asset, can simplify investment funds liabilities control and the monitoring of the fund's investors base. Quotas represented by tokens can be traded on the market without third-party intermediaries as long as players register to the Blockchain network. This can simplify internal procedures and streamline investments through the adoption of smart contracts.

The European Union is paying special attention to the development of digital innovation mechanisms and the adoption of Blockchain technology. In order to attract investments to the sector, in November 2019 the European Investment Fund and the European Commission announced a EUR 100 million investment initiative for venture capital funds and investors that supported Blockchain-based products and services, and artificial intelligence[20] In addition to private investors, co-investments with public investment banks will also be allowed. This is projected to attract another EUR 300 million from private investors.

The use of Blockchain technology allows investment funds to simplify administrative and compliance procedures. This technology provides market players with reliable and transparent data on market transactions, reducing the need for **(i)** direct interaction and exchange of information between the parties and **(ii)** intermediaries in their legal and commercial relations.

Technology companies are already seeking to simplify the exchange of information in private equity investment negotiation and in monitoring processes through initiatives that use Blockchain technology, in order to allow the parties involved in any negotiation to view a single compiled version of the transaction documents and all the other data related to the business. This reduces the need for exchanging e-mails and face-to-face negotiations, and parties can negotiate remotely, simultaneously, transparently and securely after registering on the platform[21].

18 http://www.cvm.gov.br/noticias/arquivos/2020/20200401-1.html

19 https://www.sec.gov/news/public-statement/digital-asset-securites-issuuance-and-trading

20 Available at: https://panoramacrypto.com.br/uniao-europeia-tem-planos-ambiciosos-para-blockchain/ and https://ec.europa.eu/digital-single-market/en/investing-blockchain

21 https://mediacenter.ibm.com/media/Northern+Trust+Corp.+simplifies+private+equity+management+with+IBM+Blockchain/1_ktsdst1h

Among the various Blockchain initiatives in the investment fund industry[22] [23], the record of the fund's transactions and assets on the ledger:

(i) facilitates data protection, while simplifying the disclosure of information about an investment fund among its third-party service providers, thus facilitating compliance and risk management activities;

(ii) speeds up access to investment and divestment information in order to calculate a fund's net worth;

(iii) facilitates the reporting of periodic information to quotaholders and regulators, based on the updated information contained in the ledger;

(iv) allows auditors to use the data stored in the ledger to access the information they need to carry out any necessary periodic reports, with direct access to the fund's database.

For Brazilian credit rights investment funds (FIDCs), Blockchain technology is especially relevant to activities undertaken by the fund's custodian. Since the controlling, verification and monitoring of credit rights are complex activities – requiring both considerable time and resources to control widely dispersed asset portfolios –, associated guarantees tend to be simplified with the use of data control technologies. Thus, the use of Blockchain tends to increase asset traceability, facilitating the verification of maturity dates, guarantees and default rates, as well as the settlement of credit rights.

In terms of public offerings of an investment fund's quotas, DLT technologies would allow:

(i) documents to be registered in a ledger, making the instant sharing of documents and validated information between intermediary institutions and other third-party service providers, as applicable;

(ii) subscription through smart contracts that consider the offering conditions; and

(iii) greater reliability and security in clearing, settling and monitoring quotas' ownership.

In this sense, the Luxembourg Stock Exchange and its affiliate Fundsquare, together with Clearstream, Credit Suisse Asset Management, and Natixis Investment Managers, announced a Series A funding for the "FundsDLT"[24] in March 2020. It is a platform for investment funds with distributed ledger technology, based on the Ethereum Blockchain, which optimizes the distribution of funds. The system allows asset managers, distributors, service providers and the supply chain to reduce costs as it removes redundant activities – providing transparency and allowing the distribution of digital funds, records and account management, transaction processing and settlement, and generation of corresponding reports.

22 https://www.investidor.gov.br/portaldoinvestidor/export/sites/portaldoinvestidor/publicacao/Apresentacoes/IECBrazilFinTechDay_DLT_Oliver-Cunningham_14h.pdf - Relatório KPMG, 2016

23 https://www2.deloitte.com/content/dam/Deloitte/br/Documents/financial-services/Blockchain_portugues.pdf - Relatório Deloitte, 2017

24 Available at: https://cointelegraph.com.br/news/european-financial-institutions-to-launch-blockchain-investment-platform

HOW CAN WE HELP?

- Strategic assistance to fiduciary administrators, portfolio managers and other third-party service providers working in the investment fund industry in adapting and complying with the legal and regulatory requirements for the use of Blockchain;

- Development of internal corporate policies and documents regulating the use of Blockchain in the structuring, development and maintenance of investment vehicles in the Brazilian capital markets; and Interaction with regulatory and self-regulatory authorities regarding the adoption of Blockchain-based solutions, including participation in the CVM's Regulatory Sandbox.

SUCCESSION LAW

CRYPTOCURRENCIES AND THEIR IMPACT ON SUCCESSION LAW

On one hand, the impact of cryptoassets on Succession Law seems clear-cut. Whether these assets are classified as financial assets, currency, or property, it is certain that these assets constitute undeniable economic content. Precisely for this reason, cryptoassets would be transferred from the holder to any of his/her heirs in the event of the holder's death.

However, the intrinsic characteristics of Blockchain and cryptoassets do pose certain compatibility issues with Succession Law. A summary of these issues is presented below:

- **inviolability:** all Blockchain technology is based on an encrypted system, accessed through a unique password made exclusively available to its holder. Therefore, in the case that a password has not been made available to an heir prior to the death of the cryptocurrency holder, a Court would need to rule on the breach of confidentiality of a digital wallet, as a way of ensuring heirs' access to that information;

- **decentralization:** As Blockchain's system is supposed to be free of government influence, there is no central body that controls a person's money, making measuring the total Bitcoin that a certain person possesses impossible. Thus, due to the decentralized nature of the system, there would also be limitations on the Judiciary's ability to intervene and ensure that heirs have access to this information;

- **disintermediation:** as it is a technology independent of the protagonists of the real world, in the cryptocurrency system there is no intermediation of financial institutions, which implies the difficulty of monitoring its transfer. The lack of control over the circulation of cryptocurrencies makes the environment conducive to the use of this new form of investment as a fraud mechanism to the portion of the holder's asset that, by law, is up to his heirs.

In addition to the lack of cryptocurrency regulation by a central controlling body (whether in Brazil or abroad) and the absence of official indexes for conversion between cryptocurrency and official state currencies, there has also been a lack of legislative action regarding inheritance of cryptocurrencies in a legally secure manner.

Considering the characteristics of cryptocurrencies and their lack of national and international legislative regulation, there is a need to think about alternative methods for their transfer and use in accordance with Succession Law. After all, if a cryptocurrency holder fails to show interest in handing down virtual inheritance to his/her heirs, it is most likely to become lost in the digital universe, or it could even be used as an instrument of defrauding the heir's legal share.

In searching for these alternatives, private wills could be used as mechanisms to ensure that heirs can access information about their digital inheritance, without compromising holders' rights to keep wills confidential. However, such a will would require constant updating, as each cryptocurrency transaction generates a new key for the holder to use with the remaining resources in his/her wallet, thus potentially making the holder's wallet unusable.

Drawing on international experiences in places such as the United Kingdom and the United States, other alternatives could be: **(i)** storing the written password in a physical safe; **(ii)** the use of an email account absence system, via which a determined period without access by the holder would automatically trigger the sending of the password to the heirs; and **(iii)** the use of smart contracts in the form of a digital will.

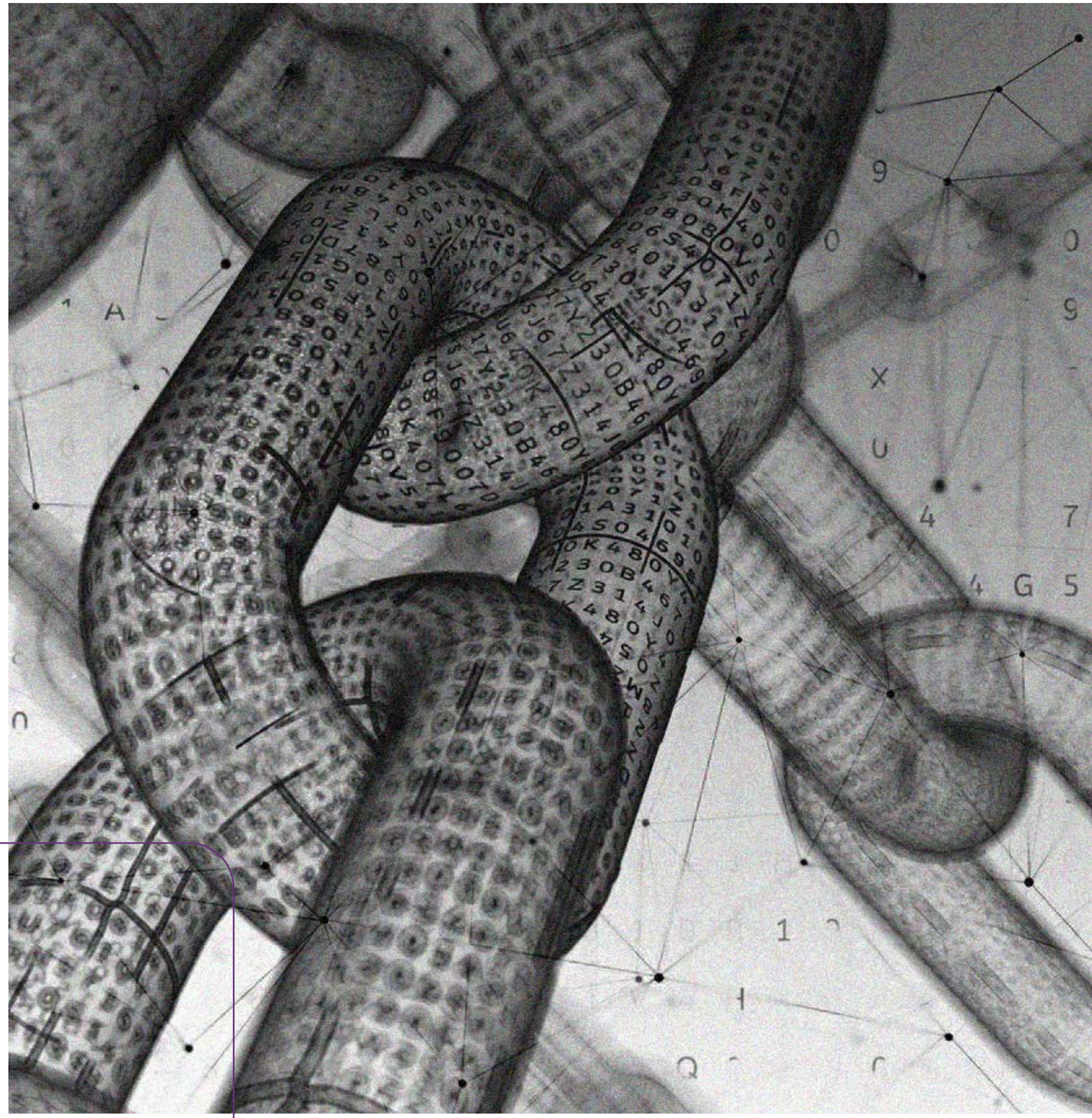
These alternatives all have potential weaknesses that require assessment in specific cases, to ensure they would be sustainable and secure when combined with the Blockchain system. This could include the convenience of plastering the use of such assets through a private will, trusting and depending on a single heir to receive a password stored in a physical safe, and poor management by

this recipient resulting in the violation of the legitimate rights of the other heirs.

Consequently, there is some uncertainty and questions about the new and emerging forms of investment borne out of Blockchain, which also extend to the legal universe. Especially in light of the current legislative void regarding the transfer of digital inheritance, it is necessary to search for suitable alternatives so that legislation may keep up with advances in technology.

HOW CAN WE HELP?

- Assistance in transmitting digital inheritance with respect to Succession Law and assessment of any relevant weaknesses in each specific case;
- Altering matrimonial regimes in courts to protect holders' assets, when applicable;
- Preparation of documents aimed at protecting the rights of cryptocurrency holders in case of divorce;
- Development instruments that guarantee the transfer of cryptocurrencies to third parties in the absence of the holder.



REAL ESTATE

Blockchain technology will bring major changes to the real estate market, especially due to the possibility of streamlining and simplifying business, lowering costs and strengthening security.

This technology allows for the automation of property transfers through the immediate access to information about the property and the parties involved in the transaction, thus accelerating analysis of the transaction history and the operation's viability.

While parties depend on notaries and other centralized entities for the traditional validation of documents – representing a security risk – the existence of an unchanging base of hashing data will allow users to certify the existence and authenticity of a document on an exact date, from anywhere at any time.

Blockchain technology should also lead to the removal of some intermediaries, making the process faster, cheaper and simpler.

Although Blockchain technology has already been used in Brazil for the purchase and sale of real estate and real estate development, such transactions also had to be carried out by traditional means in order to be legally valid and effective. This is because there is still no regulation that makes Blockchain compatible with the country's registry and notary system.

Considering the particularities of real estate legislation, the role of registry officers and notaries is still essential and indispensable to guarantee the legal security of transactions. They are required to formally qualify title deeds and check the parties' compatibility with the entire real estate registration, as well as verifying any tax collection and/or notifying authorities.

Notaries and registry offices should therefore also be taken into account in the implementation of Blockchain for electronic registration in the real estate sector. The automation and efficiency of their internal operations could be increased, cutting red tape in regard to accessing information. Users would then benefit from both more convenient services as well as more secure and efficient real estate transactions.

In Brazil, a bill has been proposed that seeks to make the registration of documents and properties with Blockchain technology mandatory[25]. It proposes changes to the Public Registry Law, along with the creation of the National Blockchain Electronic System for the Registration of Title and the Electronic Blockchain System for Real Estate Registration.

25 Bill No. 2,876/2020, by Senator Acir Gurgacz (PDT / RO).

Blockchain has been adopted in the registration of real estate in countries such as Sweden, Honduras, Georgia and Ghana. However, the registration system in these countries is very different from the Brazilian system, and the application of Blockchain is merely ancillary. Sweden has been using Blockchain technology in the real estate market since 2016 and is the first western country to explore its potential applications.

HOW CAN WE HELP?

- Assistance in the development of a range of smart contract models, including for purchase and sale commitment agreements, lease agreements, construction contracts and guarantees (i.e. fiduciary sales, mortgages, pledges);

- Consultancy and legal advice on matters related to the tokenization of assets; and

- Interaction with notaries, real estate registry officers, and the Brazilian Securities and Exchange Commission to jointly build alternatives that provide Blockchain technology transactions with legal certainty.

INFRASTRUCTURE

The potential for innovation resulting from the introduction of the Blockchain technology in the infrastructure sector and as interface in interactions with public entities is immense, especially in logistics, electricity and smart cities projects, as well as in the contractual management of those projects.

Solutions that combine Blockchain with logistics projects, either in people or cargo transportation, make the tracking of operations more effective, resulting in costs reduction, services optimization and more efficiency in related payment transactions. Accordingly, the are already some good examples of successful applications of Blockchain technology in the ocean freight sector, due to an efficiency gain in the dispatch of goods, as well as a reduction in storage costs.

As examples of the application of Blockchain in the electricity sector there are: **(i)** its use in commercialization of P2P energy - between producers and consumers - with the first application occurring in 2016 in the United States (commercialization of solar energy using Blockchain); and **(ii)** in the context of electric mobility, through the recharging of electric vehicles, whish use tends to increase in the following years.

Another application of Blockchain and smart contracts in the electricity sector may occur in **(i)** the registration of renewable energy, in order to facilitate and automate the tracking of renewable energy, that is currently done through Renewable Energy Certificates; **(ii)** the automation of the energy commercialization process within the free market, as in the Energychain project, currently supported by forty energy concessionaires in Europe; and **(iii)** improving the efficiency of back-office processes for companies in the electricity sector, such as in asset management and security and billing activities.

The Blockchain technology may also cause a revolution on smart cities, that depend on the strategic use of infrastructure, information and communication services associated with urban management and planning to meet the social and economic needs of society[26]. In other words, Blockchain will enable the coordination, integration and control of different urban services in a transparent, coordinated and efficient way, for instance, real-time street monitoring services via cameras and integrated public transportation are among a number of possibilities.

This topic became so relevant that the United Nations (UN) has created a working group to study and determine the practical applications of Blockchain in smart cities, called United Smart Cities (USC).

Regarding urban mobility and smart cities, the Municipality of São Paulo has specific rules that allow the data sharing with the Municipality's Executive Branch. Regulations in the city of São Paulo are more focused on the interaction with public entities, given the public nature of the services (which are provided by private entities through authorizations or concessions). In this sense, Decree No. 56,981 (May 10, 2016) of the Municipality of São Paulo provides for the rules for information sharing by public transport operators.

The impacts of using Blockchain technology in contractual administration in relation to infrastructure projects have been widely discussed in the United States and in Europe. The central issues of this debate point out that Blockchain could affect in a very positive way the efficiency of procedures, such as compliance check of milestones, along with hiring and paying suppliers instantly and in real-time.

Although in very early stage of development, it is already possible to verify the use of Blockchain technology by public entities in Brazil. It has been used in bidding proceedings via the SOL application (Solução Online de Licitação - Online Bidding Solution), which was developed by the states of Bahia and Rio Grande do Norte and has been used by the state of Bahia to carry out bids to purchase goods, and to procure services and construction works for organizations benefiting from the "Bahia Produtiva" project. It has also been used for similar purposes as part of Rio Grande do Norte's "Governo Cidadão" project. The use of Blockchain in bidding proceedings also results in more efficient supply chains and facilitates relationships between private parties.

HOW CAN WE HELP?

- Proposals for Expression of Private Interest (MIPs) and participation in Proposals for Expression of Interest (PMIs) that aim to include Blockchain tools in public contracts;
- Interaction with relevant authorities in ongoing concessions to promote adoption of Blockchain-based solutions;
- Advice on ongoing bidding procedures to submit requests for clarification regarding the possibility of implementing tools and solutions that are based in Blockchain technology;
- Advice on participating in public consultations opened by public entities aimed at adopting Blockchain-based solutions.

26 Concept defined by the European Union

LIFE SCIENCES AND HEALTHCARE

The continuity of traditional healthcare models seems increasingly unlikely with the disruption of new technologies in the life sciences and health industries. This change is due, in large measure, to the development of digital health initiaties, which diverges from traditional health care models by implementing a wide range of technological tools to benefit the health and well-being of individuals.

Blockchain emerges as a promising tool in this context, as it is capable of addressing industry challenges related to the interoperability, integrity and security of the immense volume of data shared in a variety of contexts throughout health care assistance. This includes prevention, diagnosis, treatment, monitoring and rehabilitation actions, as well as clinical research and the supply of health-related products.

There are already non-monetary applications in use for registration technology distributed in the public and private health sectors. One of the most evident concerns the organization and management of electronic medical records, as Blockchain enables the integration and decentralization of this data, which is commonly fragmented in different health institutions that a patient goes through during their journey.

This is the case of the Ministry of Health's National Health Data Network (RNDS). The RNDS uses virtual containers in cloud networks so that all types of health institutions (hospitals, health posts, basic health units, laboratories) can exchange information safely and minimize bureaucratic procedures - including avoiding fraud or wasting of resources, which is common in health systems. Another example comes from the Estonian government, which in 2016 created an initiative to store its population's medical data electronically using Blockchain infrastructure, through the **Estonian E-Health Foundation project**.

The tool also has the potential to allow patients unrestricted access and control to their own health data, enabling the creation of governance mechanisms to authorize or limit access, or even to share this data according to the owner's preferences, stimulating engagement and self-care. This is what the **MyHealthMyData (MHMD)** platform does, a project that consists in a consortium of European companies connecting patients, hospitals and research centers. It seeks to allow the safe sharing of behavioral, clinical, biological data, images (computed tomography, ultrasound, MRI scans, x-ray, scintigraphy) and other information via a private Blockchain network.

Blockchain technology can also contribute to the verification and authentication of digital identity, genetic data and/or patient history, as well as in the auditing of medical procedures and coordination of information between health plan operators, service providers and patients.

In the pharmaceutical sector, Blockchain has been used to trace steps in manufacturing processes and the marketing of medicines and other health-regulated products, helping to avoid fraud and counterfeiting, as well as contributing to the eventual collection of revenues when necessary. The value of the technology is currently being assessed by the United States' Food and Drug Administration (FDA), the agency responsible for regulating and inspecting health products. It has received projects developed by IBM, Merck, Walmart, Mediledger and others about how the features offered by Blockchain technology can meet the **Drug Supply Chain Security Act's (DSCSA) sanitary requirements for drug supply-chain control**, in effect from 2023.

Clinical research initiatives can also benefit from the immutability offered by Blockchain, in that it can guarantee the date and time when information was included in patient monitoring and follow-up reports, preventing any manipulation of results verified in clinical trials. When associated with other technologies such as wearable devices, artificial intelligence and big data, it also allows the continuous collection of patient data in real time, as well as predictive and behavioral analyses of each individual's health.

In financial areas – where use of Blockchain is more significant – it is also possible to integrate Blockchain with actions promoting health. Cryptocurrencies such as **Healthcoin+** aim to encourage individuals to have healthy habits by way of monetary incentives.

Another example is **DentaCoin (DCN)**, a cryptocurrency whose goal is to improve access to oral hygiene worldwide, offering alternative ways to pay for dental treatment. The use of distributed ledgers and blockchains has the potential to significantly increase security and transparency and to empower patients with greater control over their medical care, all while helping them contain or even reduce associated costs.

HOW CAN WE HELP?

Our Life Sciences and Healthcare practice is formed by a multidisciplinary team with expertise in different practices and themes related to the Life Sciences & Health sectors. Our experience covers a wide range of subjects and clients, including pharmaceutical,biotechnology, medical device and other health products companies, HMO's, hospitals, healthcare providers, healthtechs, food companies, beverage companies and investors.

We advise and represent our clients in matters related to:

- Digital health initiatives, healthtechs and other health-related initiatives, including data protection and compliance with applicable regulations, e-health, telemedicine, Blockchain, big data & analytics, artificial intelligence, tailored medical devices, 3D printing, electronic health records, Internet of Things (IoT), discount programs and new payment models;

- Regulatory consultancy in matters involving the Ministry of Health, National Supplementary Health Agency (ANS), Brazilian Health Regulatory Agency (ANVISA), National Health Council (CNS), Medicines Market Regulation Chamber (CMED), National Commission for the Incorporation of Technologies in SUS (CONITEC) and professional councils (Medicine, Pharmacy, Nursing, Nutrition, among others);

- Preparation and negotiation of typical industry contracts, including supply, distribution, agency, research and development, licensing, technology transfer, partnership, training, technical services and outsourcing contracts.

CRIMINAL LAW

From a criminal perspective, few authorities in Brazil are prepared to deal with Blockchain and related matters, especially the courts.

The most illustrative examples of Blockchain in the criminal field are cryptocurrencies such as Bitcoin, which has had all its transactional records recorded on the Blockchain ever since its first transaction.
One way to interfere in the production of new blocks would be a so-called '51% attack'. Such an attack would require dominating more than half of all the computational power of the Blockchain network, but it would also allow for the same cryptocurrency to be used more than once[27].

It is worth noting that cryptocurrencies are legal in Brazil, but not regulated. This means that cryptocurrencies are not considered currencies or securities - just equity assets. If capital gain takes place and there is an omission or any fraud before the Brazilian Federal Revenue, in theory, there could be the practice of tax crimes, as provided for in Law 8,137 / 90[28].

The Brazilian Federal Revenue forces[29] cryptoasset exchanges to provide information about their clients' transactions, including transaction dates, types, currency holders, the cryptocurrency used, transaction amounts and fee amounts.

Individuals or legal entities that do not use exchanges to transact cryptoassets or use foreign exchanges must also provide this information on a monthly basis if their transactions exceed BRL$30,000.

Anyone who fails to provide mandatory information or provides it inaccurately or after the prescribed deadlines will be subject to fines, depending on the specific case.

The Normative Instruction also provides for the possibility of the Brazilian Federal Revenue reporting cases where there are indications of money laundering to the Federal Prosecutor's Office, as provided for in Article 1 of Law No. 9,613 / 98[30].

Despite the relative anonymity of those who transact cryptocurrency, Blockchain stores all transactions carried out on the network. In this respect, Blockchain serves as an ally to transparency once again.

Conversely, an agent who uses cryptocurrency for money laundering purposes can do so without the intermediation of an exchange, or otherwise use an exchange that requires less information.[31] Agents could use several wallets, different exchanges (or none at all), and even make transactions in different countries.

Despite the immutability of Blockchain, there are services called mixers or tumblers that receive cryptocurrencies from clients and intermix them to wipe traces of the currency's origin. Cryptocurrencies are deposited by several clients, put into a larger group and then replaced randomly. Withdrawals can be made in other cryptocurrencies, and varying fees can be charged for each transaction – further preventing tracing the operation and enabling future capital integration as if it were lawful.

Another form of money laundering that is less widely used – or at least more difficult to detect – occurs when cryptocurrencies are exchanged for virtual game currencies[32] before being exchanged back into cryptocurrencies or fiat currency, eliminating criminal trails.

There are even services that analyze whether cryptocurrency is tainted. These services check if traces have been successfully cleared via cryptocurrency mixing processes.

Brazilian legislation is scarce on issues associated to the regulation of cryptocurrencies and possible related crimes in virtual environments. These money laundering methods can be considered relatively secure for the agent, as authorities are not yet properly equipped to investigate, while judges lack the appropriate technical knowledge to make decisions.

In theory, another crime that could be committed via cryptoassets would be the tax evasion, provided for in Law No. 7,492 / 86. Upon acquiring cryptocurrency, agents are able to withdraw it abroad immediately. As there is no proper remittance, it would also make it more difficult to criminalize. Furthermore, cooperation between international authorities is not yet strong enough to detect and remedy this type of operation.

Even though the Brazilian Federal Revenue tries to control exchanges and

27 In the case of cryptocurrencies, blockchain serves both to give them validity and to prevent double-spending – maliciously using the same cryptocurrency more than once.
Cryptocurrency transactions like Bitcoin are usually registered in the blockchain and, simply put, each transaction generates a note in the amount to be transacted, containing a kind of timestamp. If a 51% attack happens, it is possible to use the same note more than once, as its registration on the blockchain will be compromised.

28 Even with the possibility of configuring these crimes, the courts have no means of blocking assets as they would in the BACENJUD system (a platform that connects the Judicial Branch to financial institutions via the Central Bank of Brazil)..

29 Normative Instruction RFB 1,888, of May 3, 2019, which became effective on August 1 of the same year.
This instruction has tax effects: there is still no regulation specifically aimed at preventing money laundering with cryptocurrency.

30 Article 1, Law No. 9,613 / 98: Hide or conceal the nature, origin, location, disposition, movement or ownership of assets, rights or values arising, directly or indirectly, from a criminal offense.
Penalty - imprisonment, from 3 (three) to 10 (ten) years, and a fine.
Paragraph 1. The same penalty applies to anyone who, aiming to conceal or conceal the use of assets, rights or values arising from a criminal offense:
I - convert them into lawful assets;
II - acquires, receives, exchanges, negotiates, gives or receives them as a guarantee, keeps them, deposits, moves or transfers them;
III - imports or exports goods with values that do not correspond to the real ones.

31 For example, some exchanges require a name, Individual Taxpayer Identification Number (CPF); and date of birth. A person with malicious intent can easily use the CPF of a third-party they do not know to register and thus make tracking difficult.

32 Particularly MMOs (Massive Multiplayer Online Games), where thousands of people can play at the same time on the same server. These games generate a kind of parallel economy with virtual currencies peculiar to each game that can be bought with real money or cryptocurrencies - and, later, be sold (and repurchased again) with real money or cryptocurrencies, erasing any possible criminal trails. Authorities around the world do not yet have sufficient capabilities to investigate this type of transaction efficiently.

individuals and companies that trade in cryptocurrency, from a criminal point of view there is currently no structure capable of identifying, preventing and eventually sanctioning possible conduct.

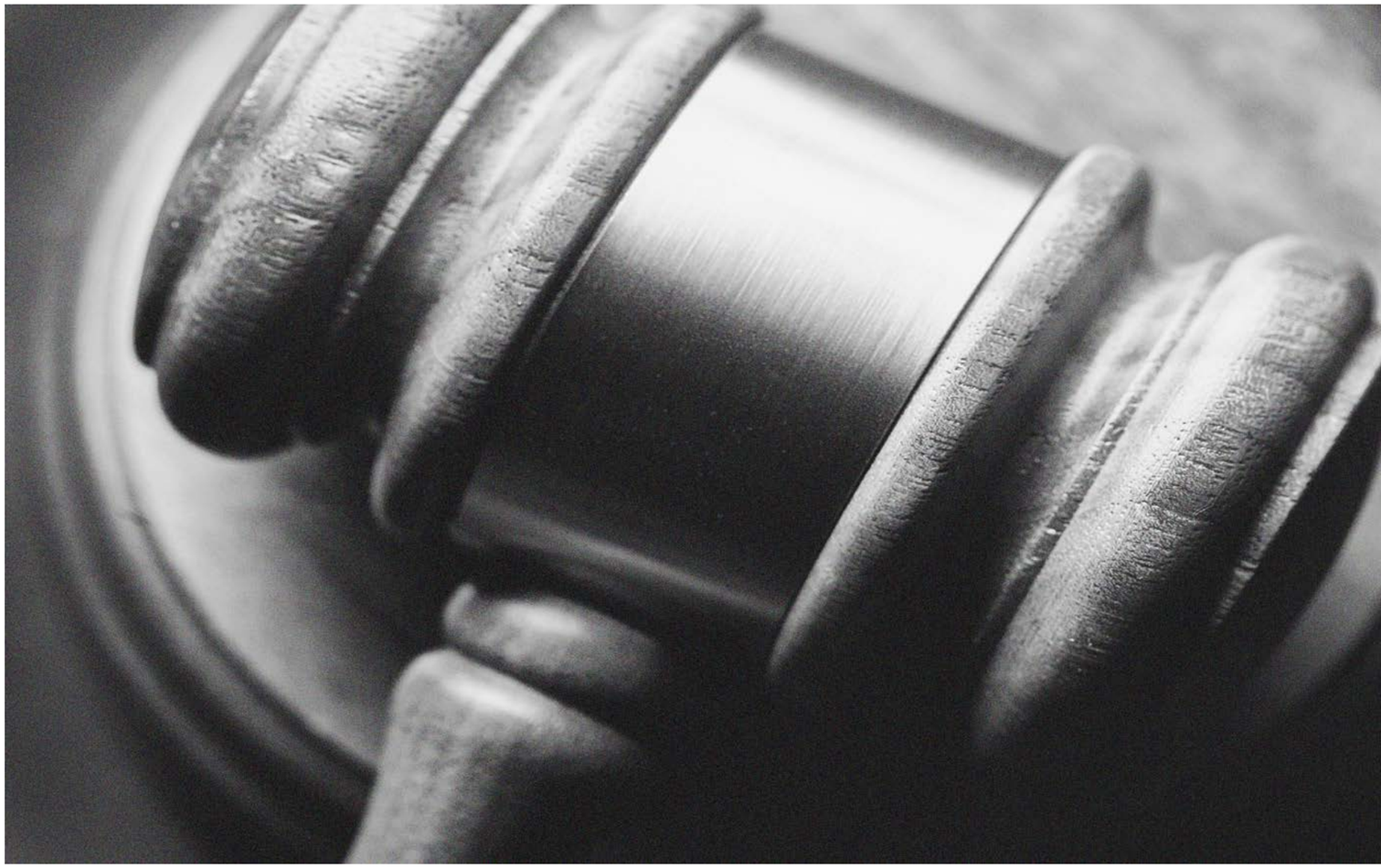
In Brazil, the Public Prosecutor's Office has already provisionally implemented a Support Group on Cybercrime (GACC) and is in favor of the regulation of a cybercrime law and the ratification of the Budapest Convention, which aims to harmonize national laws of different countries on the subject and increase international cooperation to improve investigative techniques. There is also a Center for Combating Cyber Crimes, which has a trained technical team to assist in investigations.

EC3 (European Cybercrime Center) is a division of Europol focused on cybercrime, with subdivisions that investigate crimes such as fraud and child pornography. Europol has already expressed itself in favor of using Blockchain for greater transparency in all types of transactions, as well as bringing government officials closer to the private sector to prevent and detect crimes facilitated by cryptocurrencies, and to assist in asset recovery.

The United States-led FATF (Financial Action Task Force) has released an updated practice guide recommending that exchanges and similar institutions have the same duties as traditional financial institutions. Such duties include identifying who sends currency to whom, as well as developing processes to enforce these institutions to share this information with other exchanges and authorities. Among the obligations, there would be due diligence procedures, such as know-your-client programs. The intention is to create a global standard of transparency.

HOW CAN WE HELP?

- Consulting on possible criminal implications resulting from the use of cryptoassets;
- Legal advice on preventing and combating money laundering, tax evasion, and other crimes through cryptoassets.



PRIVACY AND DATA PROTECTION

As demonstrated in this guide, Blockchain is nothing more than a data processing technology that promises to revolutionize different sectors of the economy.

Some of its basic functionalities – such as encryption, transparency and consensus mechanisms for verifying the veracity and integrity of data – can increase the security and confidentiality of data. In this way, there are already some initiatives that propose the use of Blockchain for the establishment of privacy management platforms, for example for the proof of consent and transparency about the sharing of data with third parties[33].

One example that has gained prominence recently is the use of Blockchain in tackling the Covid-19 pandemic. Access to personal data has become increasingly necessary for developing efficient public policies. However, the manipulation of a large amount of information – especially health-related information – has raised several discussions about privacy and data protection.

Certain initiatives based on Blockchain technology, such as iReport Covid-19[34] have been shown as a possible solution to collecting personal data while preserving the privacy of the data subjects. iReport Covid-19 is a questionnaire developed by the Singapore-based Algorand Foundation, which has a global reach and collects data from volunteers about the pandemic, such as the existence of symptoms and positive diagnosis. The records are distributed on the Blockchain and all changes are updated at the various ends of the chain, making it extremely difficult to delete or manipulate any data already registered. Furthermore, the encryption used on the platform makes it virtually impossible to identify respondents.

However, even though Blockchain technologies may prove to be allies in information security and privacy agendas in certain circumstances, it is necessary to reconcile these tools with data protection laws, such as the European General Data Protection Regulation (GDPR), and Law 13.709 / 18, better known as the Brazilian General Data Protection Law (LGPD). This is because some intrinsic characteristics of Blockchain, especially of public Blockchains35, can counter the principles advocated by these laws:

- **Processing Agents:** The main characteristic of a Blockchain is that it is a decentralized technology, which waives the need for intermediaries to support the transactions that occur in it. However, this attribute may be in direct conflict with basic principles of data protection laws: liability and accountability. The identification of processing agents such as controllers and processors is essential for the exercise of the rights of data subjects. Thus, when considering the use of Blockchain technologies, it is necessary to keep in mind the role of each of the stakeholders involved and their respective responsibilities.

- **Extraterritoriality:** Data protection laws such as GDPR and LGPD have extraterritorial application. As Blockchain is a decentralized technology, in which different stakeholders may be spread across different jurisdictions, these platforms may be subject to the application of different laws. This can prove to be a challenge not only for regulators but also for the platform owners, who must consider factors such as cost to comply with all applicable laws and regulations.

- **International data transfer:** The decentralized nature of Blockchain presents challenges even in relation to the restrictions imposed on the international transfer of data. For example, the LGPD establishes specific conditions for data collected in Brazil to be transferred to other countries. These conditions generally require controllers to adopt centralized governance systems, which may prove incompatible with the use of Blockchain technologies.

- **Subject's rights:** Another striking feature of Blockchain technology is immutability. It is very difficult to remove information once it is inserted into Blockchain, especially in notary registration applications, smart contracts and supply chains, where the auditability of transactions is of utmost importance. Thus, a new consensus is needed among the participants to change certain information, who simply add a new block with the updated information instead of eliminating the data. This activity goes directly against the rights of data subjects, including the right to rectify or delete data.

Considering the above, it is clear that there are several challenges to the adoption of Blockchain technologies in compliance with data protection laws. Thus, public or private organizations that wish to implement this technology must conduct a careful analysis of the limits imposed by applicable legislation and assess the risks involved for data subjects.

33 Zyskind et al. Decentralizing Privacy: Using Blockchain to Protect Personal Data. 2015 IEEE CS Security and Privacy Workshops. Available at: http://homepage.divms.uiowa.edu/~ghosh/blockchain.pdf

34 https://ireport.algorand.org/pt

34 Public blockchains are fully decentralized networks and open to anyone who wants to participate. These networks do not have an organization that controls them, so their rules are defined by the consensus of the participants. Private blockchains are controlled networks, in which you need to be allowed to participate or read the data of the chain.

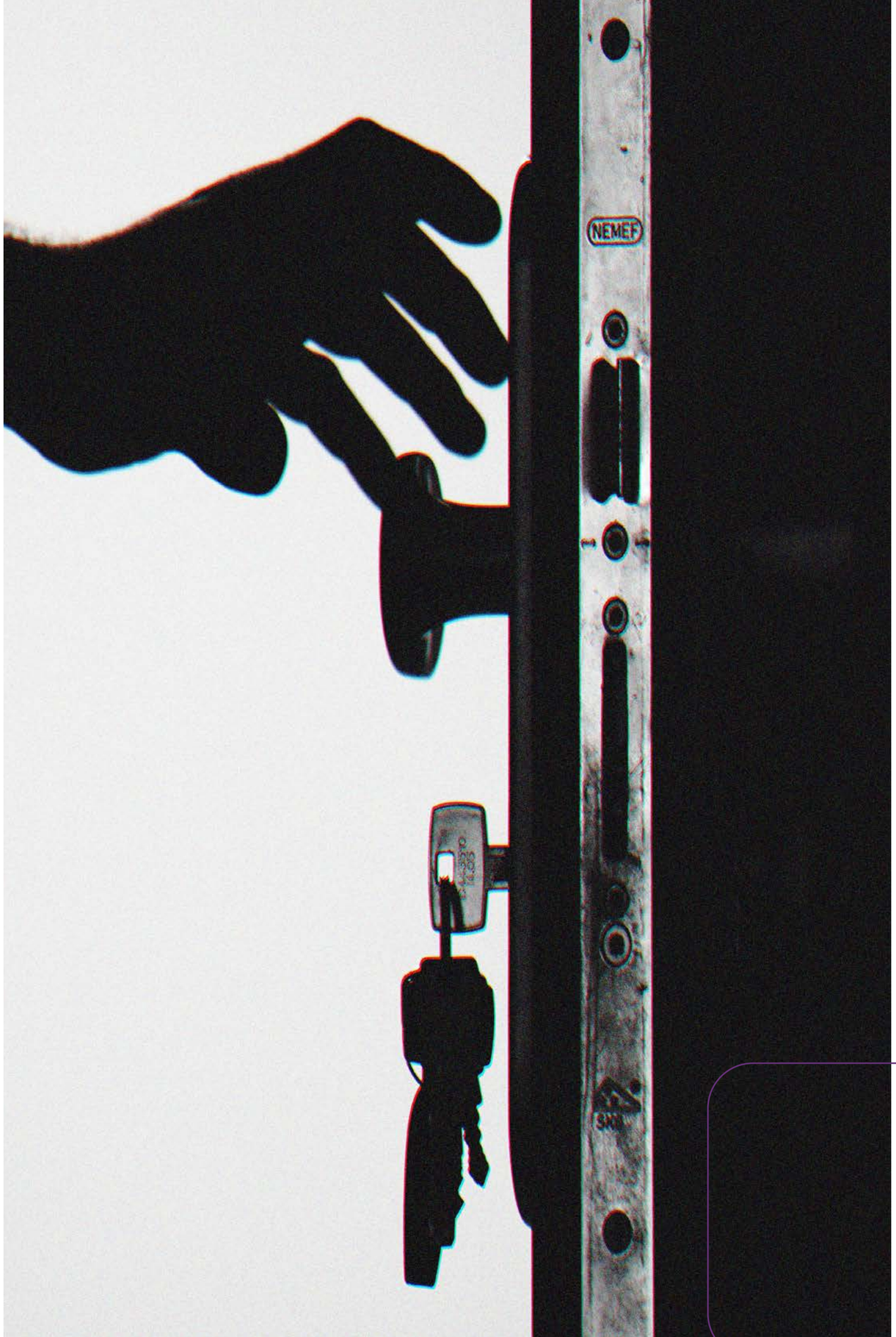
HOW CAN WE HELP?

- Assisting companies' adaptation to legal and regulatory requirements for the use of Blockchain, from a consumer and data protection perspective;

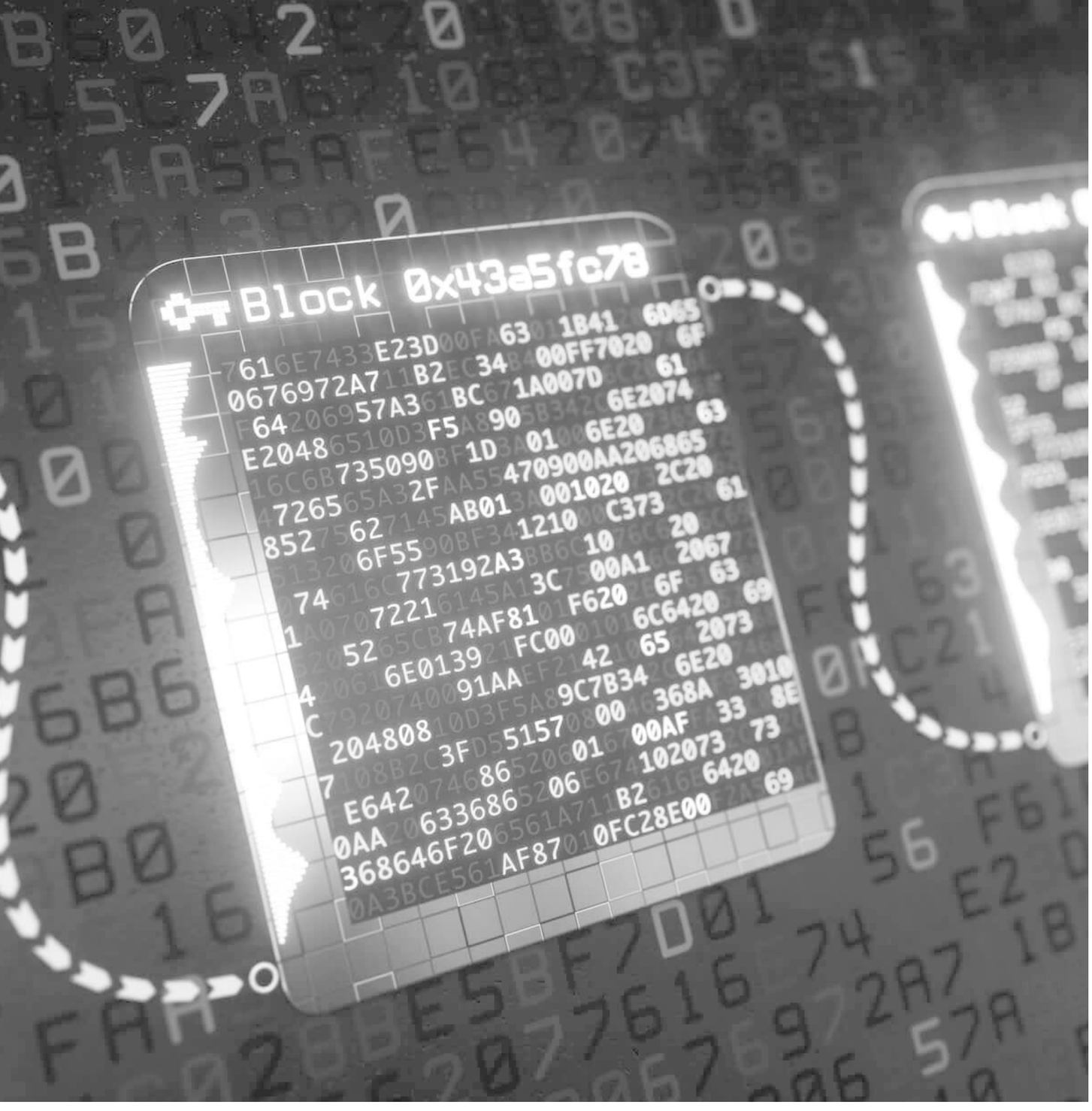
- Consultation and legal advice on legal and regulatory aspects related to the processing of personal data in solutions that use Blockchain, including the storage, sharing and international transfer of data;

- Development of privacy policies and terms of use that regulate Blockchain-based solutions;

- Interaction with regulatory and supervisory authorities and the construction of the argument for the adoption of Blockchain-based solutions.



INTELLECTUAL PROPERTY



34 Through blockchain technology, it is possible to monitor the authenticity of a product's elements during all its production stages, from the storage of raw materials to the manufacturing of the final product.

35 Concept presented at the "Workshop on Blockchain" organized by WIPO. Presentation "Smart Trade Mark - IP Australia", available at https://www.wipo.int/meetings/en/details.jsp?meeting_id=51407. Accessed on June 1, 2020.

Within intellectual property (IP), the application and potential development of Blockchain technology can be observed on several fronts, including **(i)** patents; **(ii)** trade secrets; **(iii)** smart records of intellectual property rights; **(iv)** evidence of prior use; **(v)** combat of piracy and plagiarism; **(vi)** confirmation of origin and authorship of a given work; **(vii)** tracking the production of a merchandise; **(viii)** copyright management; **(ix)** control of digital copies; and **(x)** smart contracts.

One of the great innovations in the use of Blockchain for intellectual property is its **decentralized** quality, which allows the simultaneous and direct occurrence of several transactions between users of the system in a reliable and transparent way. By enabling the parties to verify the information that will be inserted in the transaction records in advance, blocking any changes to the entries already made, the technology removes the need for a central authority figure to monitor or even to validate the transaction, the latter of which is usually the responsibility of government agencies specialized in IP rights around the world.

All information stored on Blockchain has the advantage of remaining anonymous and having its content protected by the **encryption** itself, giving its records a high degree of reliability. This technology is able to ensure that the confidentiality of information will be maintained throughout the transaction and may even protect corporate trade secrets from potential unauthorized disclosures. The parties involved in the transaction are therefore able to assume responsibility for verifying any and all interactions that occur on the network, again removing any need for a central authority figure to oversee transactions.

The information stored on Blockchain can even serve as a **certificate of authenticity for a product protected by geographical indication**. Blockchain allows its users to access information about each stage of the production and distribution chain of a given asset[36]. Given the impossibility of monitoring and fully ensuring the protection of products in foreign markets, the use of Blockchain to store information about the manufacture and authenticity of goods can help to indentificate infractions.

As an example, the Australian government has discussed the applicability of Smart Trademarks[37], which involve a similar concept of using the consumers of a product to verify its authenticity. By tracking Blockchain hashes, such as bar codes or QR codes, all stakeholders involved in the chain of a product's sale can check its registration and even determine its origin. The proposal also involves the creation of a software that authorizes payment through cryptocurrencies from the product's manufacturing to its sale process.

An important movement in recent years has been the search for ways to protect

the Blockchain technology itself. Filing patent applications seems to have been the most accepted strategy so far. Currently, China dominates the market for the development of blockchain-related technology patents, leading the world in filing patent applications, ahead of other countries, such as the United States. China is also the most prepared for this topic, having invested more in blockchain technology than anywhere else. It is not by chance that the country could become a pioneer in eventual initiatives to regulate or adapt regulation of Blockchain for IP applications.

Another widely discussed topic is the possibility of Blockchain **replacing or supplementing traditional data storage bases** in local offices. The idea behind this would be to reduce the high costs that international offices allocate to keep IP asset records updated and stored on their own databases , saving resources, time and money. In this scenario, one of the potential uses of Blockchain technology is to provide a secure and easily accessible system with a central database, so these local offices are able to reduce costs and backlogs from analyzing IP assets registration applications. This common database may also provide easy interaction between different IP offices.

Blockchain can serve as **evidence of creation for different copyrights purposes**, complementing its protection, interacting with different copyright laws and facilitating the exercise of the exclusive right of use against third parties' violations. In this case, the technology is able to spotlight the creation of an author's work, from its very conception to its use. When inserting original work into the system with information about its author, it is possible to ensure its authenticity through registration in a public network. Several international offices, including the European Union Intellectual Property Office (EUIPO) , have already commenced discussions on the applicability of Blockchain for identifying illegal copying and reproduction. This measure could be quite transformative, since copyright protection is not generally dependent on registration among the almost 200 signatory countries of the Berne Convention[40].

Another important aspect is the application of Blockchain to **IP assets or digital copies**. When purchasing a book, the limit on the exhaustion of IP rights applies to that copy, so the owner of this copy may decide to sell it to a third-party or lend it to a friend. Due to the ease of copying digital files, this freedom is not found in today's digital world – copyright holders have adapted to provide access to content through platforms, instead of a copy of the book. With Blockchain, however, the digital file starts to rely on timestamping and becomes unique again. As seen in cryptocurrencies, digital copies registered on the Blockchain can be sold and loaned, reactivating the purchase of books, films and other works protected by copyright. In addition, the combination of Blockchain and computer programs that rely on integrated artificial intelligence systems provokes interesting discussions for the future of intellectual property. It is estimated that in the future, these technologies will be able to assess the likelihood of a trademark or patent application, for example, being granted or rejected via a centralized database, due to the existence of prior registers that may present themselves as potential impediments. If implemented, such technology could even be able to clarify any lingering doubts about the originality of a patent, as it would be able to search the database for pre-existing products that possess a similar utility or quality.

Regulation:

The regulatory landscape for the use of Blockchain in intellectual property is still somewhat cloudy[41]. This is because there has been much discussion about the difficulty of placing this technology within a legal status common to several countries. Today, the understanding of the legal status of Blockchain fluctuates between its identification as an asset, as a form of payment or as an intermediary service in terms of e-commerce. Depending on the classification applicable in a given country, different regulations and legal

38 In 2018, the European Union Intellectual Property Office (EUIPO) published a presentation about the expenditures for the maintenance of its database, which exceeded €10 million. GÜRKAYNAK, Gönenç. Intellectual property law and practice in the blockchain realm. 2018. Available at https://www.sciencedirect.com/science/article/abs/pii/S0267364918302218. Accessed on May 28, 2020.

39 In 2019, EUIPO organized an anti-piracy forum to combat piracy through blockchain technology. The forum called "Anti-Counterfiting Blockaton Forum" sought to bring together several organizations to rethink the future of infrastructure to combat piracy. Available at https://euipo.europa.eu/ohimportal/web/observatory/blockathon, EUIPO Blockathon, anti-counterfeiting blockchain competition.

40 Convention promulgated on September 9, 1886, which regulates the protection and principles related to copyright worldwide.

41 Brazil does not yet have clear regulations on blockchain and its applications for IP. However, the country seeks to update itself by participating in international conferences on the topic, such as "International Conference 1.0 on Digital Transformation: Intellectual Property and Blockchain Technologies", held in 2018 in Moscow, Russia. Available at https://www.gov.br/inpi/pt-br/assuntos/noticias/inpi-participa-de-evento-na-russia-sobre-novas-tecnologias-em-pi

requirements will be applicable to this technology, which may impact its applications for IP.

Furthermore, recognition of the integrity of the information stored on the Blockchain is essential for this technology to be able to gain clout among intellectual property asset holders, and to become viable through the execution of IP assets transfer and licensing agreements. Perhaps the greatest challenge is the degree of acceptability of this information as evidence in judicial proceedings.

In regard to this aspect, it has not yet been possible to reach a consensus in Europe and Oceania (different countries of the two continents are still seeking to understand more about the architecture of Blockchain and its legal framework)[42]. On the other hand Asia, and more specifically China, is already showing progress.

In China, Blockchain can now be used to protect trade secrets in legal disputes and also serve as evidence of the existence of prior supporting documents. Information stored on Blockchain becomes encryptable "hash algorithms", guaranteeing that the protected content will not be exposed. This way, Blockchain technology is able to provide evidence of the existence of a trade secret without exposing any content or information. Since 2018, the Supreme People's Court of China has already ensured that the Internet Courts of Hangzhou, Beijing and Guangzhou accept digital data as legitimate evidence, should the claimant be able to prove its authenticity.

This provision makes it legal for both Chinese and foreign companies to validate information via Blockchain technology before Chinese courts. The Hangzhou Court leading case "Huatai Yimei Culture Media Co., Ltd. and Shenzhen Daotong Technology Development Co., Ltd." (the Huatai case), of June 28, 2018, was the first case in which the judiciary recognized electronic documentary evidence via Blockchain technology as valid. The decision report also suggests that the technology will be used to demonstrate priority for use in the case of trademarks.

Furthermore, at the end of 2019, China's patent and trademark office[43] updated the regulation of its guidelines for patent examinations. The document determined that patent filings relating to Blockchain technology must undergo special analysis in order to make the patentability examination more accurate.

Another new Chinese development involves the Central Cyberspace Affairs Commission's announcement of the first domestic blockchain lot for archiving information in March 2019. These commercially available blocks offer protection services for IP assets, suitable for pointing out the moment of creation of copyrighted works, for example. According to China, there is a platform called "Anne Copyrights Blockchain"[44] which offers DCI (Digital Copyright Identifier) registration services through Blockchain technology for registering copyright works.

As we can see, the innovations presented by Blockchain are countless and hold transformative potential over the traditional processes that are known and still enforced. With further development and knowledge of this technology, there will be a trend towards the emergence of more regulatory frameworks for Blockchain, further ensuring the reliability of this system. For the future of intellectual property, Mattos Filho believes that it is essential to prepare for the changes brought on by this technology and keeps monitoring all stages of this development.

HOW CAN WE HELP?

In addition to analyzing and drafting new forms of contracts, we can also help with risk analysis for Blockchain applications and their use with IP assets. Likewise, we can help in administrative and judicial defenses of disputes related to the use of this technology, particularly by developing arguments that involve the use of Blockchain as evidence in legal proceedings. We can thus assist our clients in understanding and facing legal restrictions, without impeding the outlining of new possible legal paths that seek to adapt to the disruption sparked by Blockchain.

42 Between 2018 and 2019, WIPO conducted a workshop to unveil the future of Blockchain and its impacts on intellectual property. The movement created from this action was called "Blockchain Task Force Work Plan" which has developed several actions to better understand blockchain activities in the world and share the experiences of several countries with this technology. As presented by the Australian government "Smart Trade Mark - IP Australia", available at https://www.wipo.int/meetings/en/details.jsp?meeting_id=51407.

43 Called CNIPA (China National Intellectual Property Administration) since 2018. Available at https://www.epo.org/searching-for-patents/helpful-resources/asian/asia-updates/2018/20180905.html. Accessed on June 1, 2020.

44 COMMISSION, European. IPR Protection for AI Technology & Application of Blockchain in China. 2019. Available at https://www.china-iprhelpdesk.eu/sites/china-hd/files/public/Guide%20-%20IPR%20protection%20AI%20%26%20Blockchain%20-.pdf. Accessed on May 28, 2020

INSURANCE

Data analysis has always been at the center of the insurance market so that the increase of data available[45] and of the improvement of tools for storing and processing such data has clear effects on the insurance market.

Blockchain – especially when combined with timestamping – is an excellent tool for recording, storing and sharing data, and it can also be used together with smart contracts. These characteristics allow Blockchain to be applied in several different manners within the insurance market, such as in document registration, database sharing and process automation.

Data storage

On September 6, 2013, the Brazilian Private Insurance Council (CNSP) edited CNSP Resolution No. 294, regulating the use of remote means in operations related to insurance and open private pensions. At first, this rule required that insurance policies and certificates issued remotely[46] have either the certification of ICP-Brasil or another root certifying authority, along with confirmation of the date and time of submission.

In 2017, the Brazilian Insurance Authority (SUSEP) held a public consultation on the purchase of insurance using remote means and on December 20 of that year, CNSP edited CNSP Resolution No. 359 – modifying CNSP Resolution No. 294. This modification meant that documents issued remotely no longer require certification by ICP-Brasil or another root certifying authority, requiring only that authenticity, non-repudiation, integrity and identification of date and time were guaranteed[47].

Blockchain meets all of these requirements (authenticity, non-repudiation, integrity and timestamping). Thus, the use of Blockchain for the registration of insurance policies and certificates issued in remote operations began to be authorized, which has led to the reduction of costs associated and increased document security, as the policy or certificate registered in the Blockchain is immutable and verifiable. It is also worth noting that the encryption involved in Blockchain enables the sharing of sensitive data by the platform, so that only authorized parties have access to such information.

Database sharing

The insurance and reinsurance risk transfer process is complex and involves several participants (brokers, insurance companies, reinsurance brokers, reinsurers, among others) who share and negotiate based on a huge amount of data, aiming to combine capital with risks.

Blockchain has the potential to allow insurance market participants to remove inefficiencies arising from segregated data storage, (i.e. there is a risk of inconsistencies and the need for data reconciliation and verification), as it can allow for the sharing of the same stored data on the Blockchain among all involved participants in an operation. Such benefits of Blockchain can be seen more clearly in the processes of risk underwriting, loss adjustment and also in the supervision of the insurance market.

In risk underwriting, whenever the relevant information regarding a risk to be insured is entered into the Blockchain, brokers, insurers and reinsurers involved in the operation can have access to such data simultaneously. This could lead to better analysis and more competitive pricing of risks, increasing the efficiency of the market as a whole.

Database sharing via Blockchain also has applications for the duration of the risk, and in the operation of any risk-related event it can be used to publicize those involved – for example, inclusions and/or exclusions of assets and people in insurance collective.

Nevertheless, the positive effects of database sharing via Blockchain would be even more noticeable in the loss adjustment - crucial in the user/policyholder experience. The traditional loss adjustment process can involve numerous forms, exchanges of documents between insurers and is generally quite time-consuming. Once information about a particular claim is entered and shared between the parties involved via Blockchain, this process can cut red tape, allowing for faster loss adjustment and payment of compensation, with less inconvenience to policyholders.

Finally, the registration of operations in Blockchain could guarantee regulators, auditors and rating agencies easy access to the records of insurers and reinsurers operations, reducing supervision costs and leading to increased transparency and improved supervision of the insurance market.

45 In an article by Forbes, Bernard Marr declared that the amount of data generated in 2013 and 2014 would be greater than the amount generated by humanity before such a period: "the data volumes are exploding, more data has been created in the past two years than in the entire previous history of the human race." (https://www.forbes.com/sites/bernardmarr/2015/09/30/big-data-20-mind-boggling-facts-everyone-must-read/#2e13851517b1, accessed on 31/05/2020).

46 For the purposes of such rule, remote media refers to "ones that allow the exchange of and/or access to information and/or any type of data transfer through communication networks involving the use of technologies such as the world wide web, telephony, cable or digital television, satellite communication systems, among others."

47 Article 4, paragraph 3, of CNSP Resolution No. 359, of December 20, 2017.

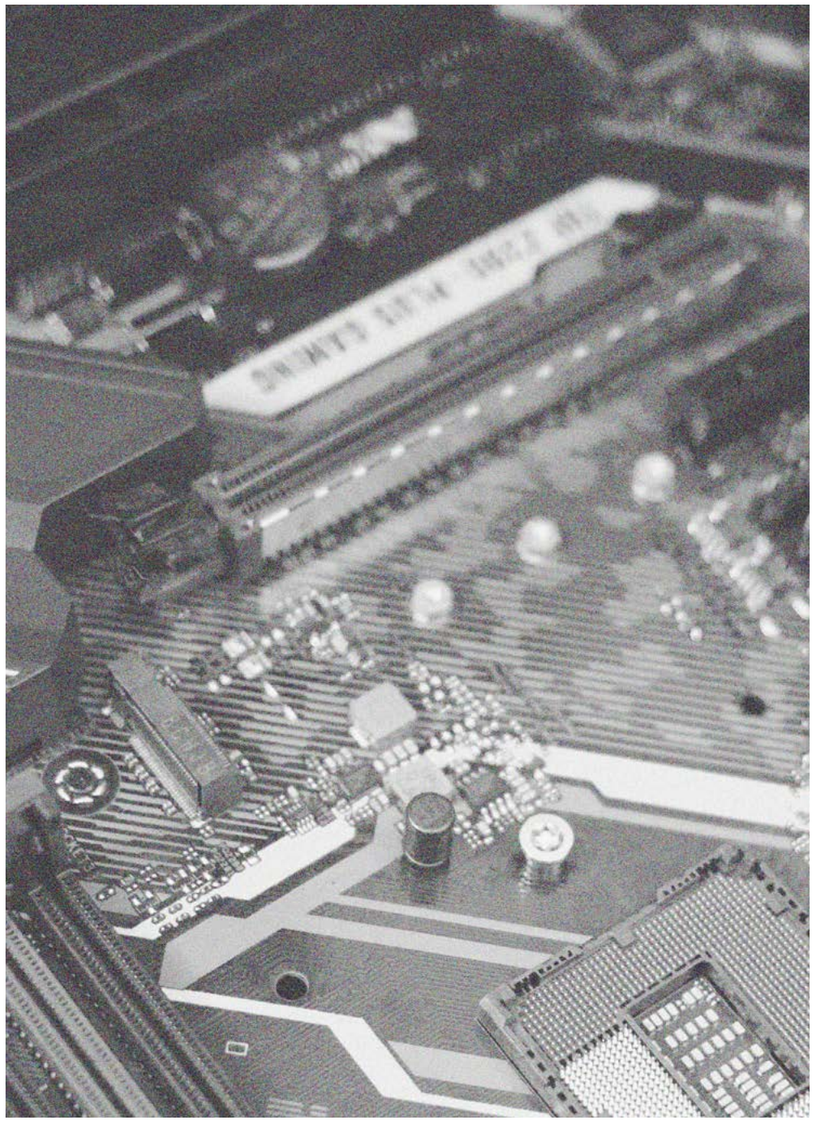
Regulations

Blockchain can be used to store data from remote operations under the terms of the current regulations.

Moreover, in April 2020, SUSEP, the Brazilian Insurance Authority (SUSEP), the Securities and Exchanges Commission (CVM) and the Brazilian Central Bank put the Regulatory Entities Information Integration Platform (Pier) into operation. This platform makes use of Blockchain technology and allows instant sharing between the databases of the various agencies, decreasing the cost of compliance required from regulated parties, while strengthening and cutting red tape in the supervision and inspection processes.

Finally, SUSEP developed a regulatory sandbox that aims to develop innovative products and services. This environment could become a platform for testing and innovating Blockchain-based products, contributing to the development of the national insurance market.

On October 2020, SUSEP informed the 11 (eleven) companies approved to participate in the abovementioned regulatory sandbox, amongst which there are companies using Blockchain.



HOW CAN WE HELP?

The Insurance, Reinsurance and Private Pensions team is prepared to help build customized solutions for your activity through the use of Blockchain, including:

- Assistance in adapting companies to legal and regulatory requirements for the use of Blockchain;
- Consultancy and legal advice on the legal and regulatory aspects related to storage and sharing of databases on insurance, reinsurance, private pensions and capitalization, as well as application of smart contracts and tokenization;
- Development of internal corporate policies and documents regulating the use of Blockchain;
- Training in regard to the possibilities of using Blockchain in insurance;
- Interacting with regulatory and supervisory authorities and constructing arguments for adopting Blockchain-based solutions.

.

CORPORATE/ M&A

USE OF BLOCKCHAIN TECHNOLOGY BY BRAZILIAN BOARDS OF TRADE

The Blockchain technology consists on a valuable tool to ensure efficiency, agility and reliability in the registering process of corporate documents and maintenance of internal records.

In Brazil, it is possible to identify some initiatives for the adoption of Blockchain technology by certain public administration entities. The Board of Trade of the State of Ceará (JUCEC) stands out for being a pioneer in the country due to the use of this technology, contributing to index the background of business records filed before JUCEC until the 2017 fiscal year (i.e., in a database).

The efforcement of Blockchain technology in the scope of corporate acts' filing procedures before boards of trade in Brazil follows the digital transformation of these entities which was promoted by the Department of Business Registration and Integration ("DREI"), regulating in 2018 the digital registry of documents. Blockchain technology contributes to increase data quality and provides better reliability in the registration process of corporate acts, ensuring the chronology of the filing procedure, and besides also improves the agility and efficiency for this process.

DREI enacted on December 1st, 2020, the Ofício Circular SEI No. 4081/2020/ME, establishing that cryptocurrencies and other digital currencies may be used as a payment mechanism for purposes of corporate transactions and payment-in of companies' corporate capital. As provided in such regulation, there are no specific formality for registration of corporate acts involving cryptocurrencies, provided that it shall comply with the applicable rules for the payment-in with goods, considering the corporate type of the relevant entity.

MAINTENANCE OF CORPORATE BOOKS AND CORPORATE ACTS VIA BLOCKCHAIN

Blockchain technology could be used for the maintenance of share registry and share transfer books, in order to facilitate and modernize Brazil's records registration process considering the method currently adopted in Brazil for this purpose, which is still manual.

Upon the dissemination of the use of Blockchain technology among boards of trade, the companies which are interested in using the technology to maintain internal records may also register corporate acts directly in a Blockchain network. Additionally, upon the confirmation of the validity of the content by boards of trade, documents may be registered in a secure and immutable basis.

The implementation of Blockchain technology as described above would guarantee greater reliability and efficiency in the chain of corporate events, contributing for a faster and more accurate verification of the corporate shareholding structure.

VOTING REGISTRATION AND MONITORING GENERAL SHAREHOLDERS' MEETINGS VIA BLOCKCHAIN

The implementation of virtual general shareholders' meetings are already a reality in Brazil; however, the platforms available for this purpose are still being improved.

It is possible to notice the use of Blockchain technology in foreign companies' general shareholders' meeting in connection with the applicable voting systems. This is particularly accurate when it relates to controlling general shareholders' meetings rules, their acceptance by attendant shareholders via smart contracts, encrypted records of platform access, as well as votes presented by the attendant shareholders. Although it is still in its early stages, the Brazilian Association of Fintechs (ABFintechs), for instance, has started a transition using the technology to enable the attendance of its associates to the corresponding meetings.

Blockchain technology proves to be a useful alternative for ensuring efficiency and reliability for the whole process in connection with virtual meetings, with the possibility of ensuring greater safety in the process of accounting the shareholders entitled to voting rights, as well as the respective votes presented in such meetings.

HOW CAN WE HELP?

- Legal assistance and advisory on legal and regulatory aspects related to the storage of electronic corporate documents on a Blockchain platform; and
- Assistance in coordinating meetings and/or virtual general shareholders' meetings with both identity verification and voting registration through a Blockchain platform.

TAX

CURRENT REGULATION

In the scope of tax law, **there is no** defined **normative framework** in relation to the use of **Blockchain** and the tax treatment applicable to transactions involving **cryptoassets** (**cryptocurrencies**, tokens and smart contracts) in general.

Nevertheless, there has been an increasing use of these resources and technologies over the last few years, resulting in repercussions in the tax area. Regulations must adapt to the current reality, particularly addressing the following questions:

- What is the **legal nature** of **cryptoassets** from a tax perspective (i.e. currency, means of payment, financial instrument, asset, property)?
- How should **transactions** involving cryptoassets be **characterized** for the purpose of enforcing tax legislation?

Cryptocurrencies

Despite the lack of effective regulation in Brazil, particularly with regard to **cryptoassets**, the Brazilian Federal Revenue (RFB) issued regulations imposing the obligation to provide information of transactions involving such assets (IN RFB nº 1,888/2019)[48].

CRYPTOASSET

According to the RFB, a cryptoasset is the "digital representation of value denominated in its own unit of account, whose price can be expressed in local or foreign currency, traded electronically using cryptography and distributed registration technologies, used as a form of investment, value transfer instrument or access to services, and that is is not recognized as currency."

As a rule, transaction information must be provided periodically by the Brazilian legal entity offering services related to cryptoasset transactions – including intermediation, negotiation or custody – and who can accept any means of payment, including other cryptoassets (**Exchange**), regardless of the amount of the transaction.

However, if **(i)** the transaction is carried out via a foreign exchange or without the intermediation of any exchange; and **(ii)** the total amount of the monthly transactions exceeds BRL$30,000, the information must be provided directly by the individual or legal entity resident in Brazil.

All types of transactions involving transfers of cryptoassets must be informed, including purchases and sales, exchanges, donations, transfers of cryptoassets to an exchange, withdrawal of cryptoassets from an exchange, temporary assignments (loans), donations in payment and issue. The RFB has also clarified that transactions involving the **exchange of one cryptoasset for another** must be informed[49].

Especially when considering **cryptocurrencies** traded by individuals, the RFB has clarified that cryptoassets are equivalent to **financial assets**, which must be declared at their **acquisition value** in the **DIRPF** (Income Tax Return), in accordande to the specific codes provided below:

48 Normative Instruction RFB No. 1,888, of May 3, 2019. Available at http://normas.receita.fazenda.gov.br/sijut2consulta/link.action?visao=anotado&idAto=100592

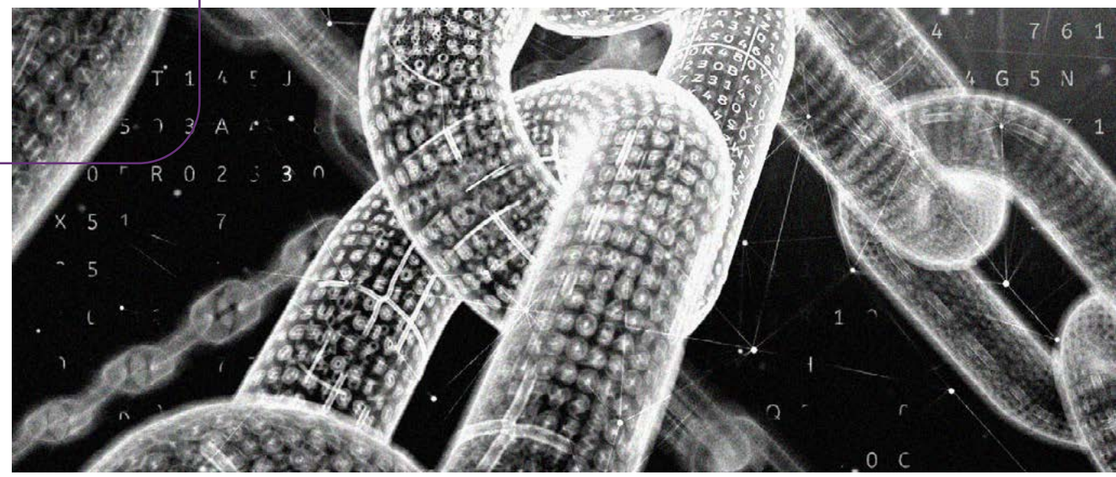
49 Guide for providing obligatory cryptoasset transaction information to the Brazilian Federal Revenue and Open Data. Available at http://receita.economia.gov.br/orientacao/tributaria/declaracoes-e-demonstrativos/criptoativos/arquivos/manual-de-preenchimento-criptoativos-versao-1-0-0.pdf ; and http://receita.economia.gov.br/orientacao/tributaria/declaracoes-e-demonstrativos/criptoativos/criptoativos-dados-abertos.pdf.

CODE	CODE DECRIPTION	OBLIGATION TO DECLARE	DESCRIPTION
81	Bitcoin - BTC	Acquistion value of R$ 1.000,00 or more	Quantity, name of the legal entity where the assets are in custody, legal entity's taxpayer registry. In case of individual's own custody, the model of digital wallet used (Ledger nano, Ledger X, Trezor, etc).
82	Other types of cryptocurrencies	Acquistion value of R$ 1.000,00 or more	Type and quantity, name of the legal entity where the assets are in custody, legal entity's taxpayer registry. In case of individual's own custody, the model of digital wallet used (Ledger nano, Ledger X, Trezor, etc). Different types of cryptoassts must be declared separately. For example, Ether (ETH), XRP (Ripple), Bitcoin Cash (BCH), Tether (USDT), Litecoin (LTC), Brazilian Digital Token (BRZ), USD Coin (USDC), TUSD, Cardano (ADA), Binance USD (BUSD), among others.
89	Other cryptoassets not considerd cryptocurrencies (payment tokens).	Acquistion value of R$ 1.000,00 or more	Type and quantity, name of the legal entity where the assets are in custody, legal entity's taxpayer registry. In case of individual's own custody, the model of digital wallet used (Ledger nano, Ledger X, Trezor, etc). Examples: Chiliz (CHZ), Binance Coin (BNB), Chainlink (LINK), Government Debts' Tokens (MBPRK03), Consortium Tokens (MBCONS02), WiBZ (WBZ), PAX Gold (PAXG), among others.

As there is no official rate for this asset, there is no legal rule determining how the amounts should be converted for tax purposes, so the taxpayer must keep documentation proving the authenticity of the reported amounts[50].

Individuals who obtain cryptocurrency revenue totaling or exceeding BRL$35,000.00 per month will have this taxed **as capital gains** by way of income tax, via progressive rates established according to amount of gains assessed (15% to 22.5%). The RFB considers that such exemption must consider the set of cryptoassets (including cryptocurrencies) disposed in Brazil or abroad, regardless of their name and type. If the total

50 IRPF 2020 Questions and Answers. Available at https://receita.economia.gov.br/interface/cidadao/irpf/2020/perguntao/pr-irpf-2020-v-1-2-2020-04-13_publicacao.pdf http://normas.receita.fazenda.gov.br/sijut2consulta/link.action?visao=anotado&idAto=100592



disposed of in the month exceeds this amount, the capital gain related to all disposals will be subject to taxation. The payment of this income tax must be made by the last business day of the month following the transaction(s)[51].

Therefore, in the absence of specific tax legislation involving cryptoassets, the RFB has issued acts and guidelines seeking to subject such transactions to current taxation. Nevertheless, current regulations and guidelines are still in early stages of development and do not provide further details and clarifications for specific situations, including:

- **Capital gain**: in principle, transactions involving cryptocurrencies that generate an equity increase must collect the income tax on capital gains. However, there is no specific guidance for cryptoassets exploited for commercial purposes (i.e. taxation as income or capital gains) or received as wage payments (i.e. social security contributions), as occurs in other countries such as the United States[52] and the United Kingdom[53].

- **Exchange between cryptoassets**: there is still no specific regulation – the RFB only clarifies that such transactions must be informed. Several countries have adopted the understanding that it would be possible to measure the "gain" in the transaction when exchanging

51 IRPF 2021 Questions and Answers. Available at https://www.gov.br/receitafederal/pt-br/acesso-a-informacao/perguntas-frequentes/declaracoes/dirpf http://normas.receita.fazenda.gov.br/sijut2consulta/link.action?visao=anotado&idAto=100592

52 United States. Available at https://www.irs.gov/individuals/international-taxpayers/frequently-asked-questions-on-virtual-currency-transactions

53 United Kingdom. Available at https://www.gov.uk/government/publications/tax-on-cryptoassets

one cryptocurrency for another (e.g. United States[54], Canada[55] and the United Kingdom), while others choose to treat the transaction as fiscally neutral until it is converted into fiat currency (e.g. France). Meanwhile, some do not tax such transactions in certain situations, provided that particular legal requirements are met (e.g. Germany and Singapore).

- **Payment of goods and services with cryptocurrencies**: Individuals or legal entities remunerated with cryptoassets must subject amounts received for goods and/or services to the applicable taxation, as a payment in kind.

- **Donation of cryptoassets**: must be subject to ITCMD taxation (a tax for causa mortis transfers and donations), with variable rates depending on each state (São Paulo, 4%).

Tokens

For transactions involving **tokens**, in addition to the comments above, the confirmation of **tax effects** will depend essentially on the specific **characteristics** of the **instrument** traded, the underlying asset which the tokens refer to, and the rights **conferred** on its holder – in addition to the regulations applicable to cryptoassets in general.

In the case of **utility tokens** that provide access to services, the mere acquisition of a token should not result in the user's taxation. For service providers, taxation should only occur when the services are actually carried out, although there may be discussions in this regard (especially if intermediaries are involved).

Regarding **security tokens** and **hybrid tokens** acquired as investments that represent a fraction of specific goods, the rights conferred to the owner should be verified under this instrument (e.g. remuneration derived from market fluctuations), in order to assign them a specific tax treatment. The same rule applies to **royalty tokens** that guarantee holders remuneration and other rights over intangible assets to which they are linked.

Smart Contracts

Along the same lines as cryptocurrencies and tokens, there is also no specific regulation or guidance applicable to **smart contracts**. Thus, the particularities of each contract must be analyzed in order to apply the appropriate taxation.

54 United States. Available at https://www.irs.gov/individuals/international-taxpayers/frequently-asked-questions-on-virtual-currency-transactions

55 Canada Revenue Agency. Available at https://www.canada.ca/en/revenue-agency/programs/about-canada-revenue-agency-cra/compliance/digital-currency/cryptocurrency-guide.html

Given the automatic enforcement and other disruptive features associated with smart contracts, one must be aware of the moment in which the taxable events and ancillary obligations actually occur. International transactions involving more than one jurisdiction may also present particular issues, which must be assessed on a case-by-case basis.

Blockchain: opportunities

Blockchain can present itself as an effective instrument for the documentation and compliance of transfer pricing rules applicable to transactions between parties. It can facilitate the traceability of transactions and the disclosure of financial flows, based on the technology's permanent and immutable records.

The consistency and transparency of information documented on Blockchain can also benefit other types of intercompany transactions, including cost-sharing contracts. This ensures greater reliability of documentation and reconciliation of the information flow between companies.

In regard to tax compliance, the adoption of Blockchain for the issuance of invoices, submission of declarations and statements and for the fulfillment of ancillary obligations before tax authorities could increase the reliability of information provided, as well as reduce costs associated with procedures and tax defenses.

HOW CAN WE HELP?

- Tax advice on transactions involving cryptoassets (cryptocurrencies, tokens and smart contracts), for both cryptoasset issuer and acquirers (owners) of an asset, aiming to mitigate the risk of undue tax collection – especially in the absence of specific regulations and possible lack of clear interpretations by tax authorities.

- ax assessment of specific situations involving cryptoassets, such as soft fork, hard fork and airdrop events, in order to determine and apply the correct tax treatment.

- Evaluation of the supporting documentation necessary to support operations with cryptoassets and necessary conduct for transactions documented in Blockchain.

- Identifying application opportunities for Blockchain and cryptoassets in specific sectors.

- Identifying possible available uses of Blockchain to promote tax compliance.

- Tax and estate planning involving cryptoassets.

www.**mattosfilho**.com.br

São Paulo | Campinas | Rio de Janeiro | Brasília | New York | London

MATTOS FILHO > Mattos Filho, Veiga Filho, Marrey Jr e Quiroga Advogados