


**BLOCKCHAIN, A STRATEGIC TECHNOLOGY TO BE ADOPTED BY PUBLIC AND PRIVATE COMPANIES FOR THE BENEFIT OF BRAZILIAN SOCIETY**

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p>Received November, 01<sup>st</sup> 2023</p> <p>Accepted February, 14<sup>th</sup> 2024</p>	<p><b>Purpose:</b> Highlight the strategies used by organizations when using blockchain, the problems and difficulties they face, and how the use of blockchain technologies can help public and private Brazilian companies, understanding their concepts and importance.</p>
<p><b>Keywords:</b></p> <p>Blockchain; Bitcoin; Companies; Strategies; Technology.</p>	<p><b>Theoretical Framework:</b> Blockchain technology emerges to allow transactions to be more secure and transparent and is very important for organizations to make their processes more agile. However, to implement it, it is important to use strategies.</p> <p><b>Design/Methodology/Approach:</b> Important aspects for the implementation and use of blockchain by organizations, challenges, benefits, essentiality, and the need to obtain this knowledge were analyzed, therefore, four public and private Brazilian companies were analyzed, where a bibliographic review was used and, therefore, exploratory research.</p>
	<p><b>Findings:</b> Strategies were identified, such as storing and managing data with blockchain and using cryptocurrencies as a form of payment. The challenges to be overcome are usability, scalability, environmental impact, security, and crime. Public and private companies benefit from lower costs, agility, efficiency, shorter transaction times, customer attraction and greater engagement.</p> <p><b>Research, Practical &amp; Social Implications:</b> The research was relevant, and the objectives were met, the implications identified proved to be beneficial for companies and society.</p> <p><b>Originality/Value:</b> The use of blockchain by organizations to address problems and increase business scalability is essential, as it brings greater capacity to control operations in an integrated manner with better communication and greater transparency towards society.</p> <p>Doi: <a href="https://doi.org/10.26668/businessreview/2024.v9i2.4362">https://doi.org/10.26668/businessreview/2024.v9i2.4362</a></p>

**BLOCKCHAIN, UMA TECNOLOGIA ESTRATÉGICA A SER ADOTADA POR EMPRESAS PÚBLICAS E PRIVADAS PARA O BENEFÍCIO DA SOCIEDADE BRASILEIRA**

**RESUMO**

**Objetivo:** Destacar as estratégias utilizadas pelas organizações na utilização do blockchain, os problemas e dificuldades que elas enfrentam, e como o uso das tecnologias blockchain podem auxiliar nas empresas brasileiras públicas e privadas, entendendo seus conceitos e importância.

**Referencial Teórico:** A tecnologia Blockchain surge para permitir que as transações sejam mais seguras e transparentes e é muito importante para que as organizações tornem os seus processos mais ágeis. Porém, para implementá-lo, é importante utilizar estratégias.

**Desenho/Methodologia/Abordagem:** Foram analisados aspectos importantes para a implementação e utilização do blockchain pelas organizações, desafios, benefícios, essencialidade e a necessidade de obter estes conhecimentos, portanto, foi analisado quatro empresas brasileiras públicas e privadas, onde foi utilizada uma revisão bibliográfica e, portanto, uma pesquisa exploratória.

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**Resultados:** Foram identificadas estratégias, como armazenamento e gerenciamento de dados com blockchain e uso de criptomoedas como forma de pagamento. Os desafios a serem superados são a usabilidade, escalabilidade, impacto ambiental, segurança e criminalidade. Empresas públicas e privadas possuem como benefícios menores custos, agilidade, eficiência, menor tempo de transação, atração de clientes e maior engajamento.

**Pesquisa, Implicações Práticas e Sociais:** A pesquisa foi relevante e os objetivos foram atendidos, as implicações identificadas se demonstraram benéficas para empresas e para a sociedade.

**Originalidade/Valor:** A utilização do blockchain pelas organizações para enfrentar problemas e aumentar a escalabilidade dos negócios é primordial, pois traz maior capacidade de controle das operações de forma integrada com melhor comunicação e maior transparência para com a sociedade.

**Palavras-chave:** Blockchain, Bitcoin, Empresas, Estratégias, Tecnologia.

## BLOCKCHAIN, UNA TECNOLOGÍA ESTRATÉGICA A SER ADOPTADA POR EMPRESAS PÚBLICAS Y PRIVADAS EN BENEFICIO DE LA SOCIEDAD BRASILEÑA

### RESUMEN

**Propósito:** Resaltar las estrategias utilizadas por las organizaciones al utilizar blockchain, los problemas y dificultades que enfrentan y cómo el uso de las tecnologías blockchain puede ayudar a las empresas públicas y privadas brasileñas, entendiendo sus conceptos e importancia.

**Marco Teórico:** La tecnología Blockchain surge para permitir que las transacciones sean más seguras y transparentes y es muy importante para que las organizaciones agilicen sus procesos. Sin embargo, para implementarlo es importante utilizar estrategias.

**Metodología:** Se analizaron aspectos importantes para la implementación y uso de blockchain por parte de las organizaciones, desafíos, beneficios, esencialidad y la necesidad de obtener este conocimiento, por lo tanto, se analizaron cuatro empresas públicas y privadas brasileñas, donde se utilizó una revisión bibliográfica. y, por tanto, una investigación exploratoria.

**Conclusiones:** Se identificaron estrategias como almacenar y gestionar datos con blockchain y utilizar criptomonedas como forma de pago. Los desafíos a superar son la usabilidad, la escalabilidad, el impacto ambiental, la seguridad y la delincuencia. Las empresas públicas y privadas se benefician de menores costos, agilidad, eficiencia, tiempos de transacción más cortos, atracción de clientes y mayor compromiso.

**Implicaciones de la Investigación:** La investigación fue relevante y se cumplieron los objetivos, las implicaciones identificadas resultaron beneficiosas para las empresas y la sociedad.

**Originalidad/Valor:** El uso de blockchain por parte de las organizaciones para afrontar problemas y aumentar la escalabilidad empresarial es fundamental, ya que aporta mayor capacidad para controlar las operaciones de forma integrada con una mejor comunicación y mayor transparencia hacia la sociedad.

**Palabras clave:** Blockchain, Bitcoin, Empresas, Estrategias, Tecnología.

### INTRODUCTION

We currently live in a society where everything is connected through the internet, and we use it to work, access social networks, send messages through emails or other messengers, we also use the internet for cloud computing, internet of things (IoT), among many other tools that help us in our daily lives, the internet brings greater mobility and ease to both people and organizations.

However, the internet has limitations that we have to deal with, where we cannot trust each other, much less carry out financial transactions without the participation of a third party in the process, but these third parties can collect data for commercial and governmental gain and can invade our privacy. But that's not all, according to Tapscott & Tapscott (2017), even

though the internet is widespread worldwide, its cost structures still exclude around 2.5 billion people from the global finance system.

Given this, blockchain technology emerges to allow transactions carried out on the internet to be more secure and transparent between users without the need to use intermediaries. Thus, Alves et al. (2020) emphasize that blockchain enables a unique form of data protection on the network, through decentralized control that guarantees security in transactions carried out. In this way, transactions that are carried out over the internet can be carried out without interference from intermediaries, whether financial institutions or the government itself.

Thus, the blockchain can bring financial inclusion to people who do not have access to traditional banks because they have high fees, as the blockchain ends up eliminating fees that can often be exaggerated, also bringing greater agility in transactions and less bureaucracy, guaranteeing the security of your data.

In this way, the use of blockchain can bring more security, privacy and freedom to people, companies and even governments, but in addition to the benefits, blockchain technology has its criticisms and challenges such as scalability and usability, which may need to be resolved. them so that it can positively impact society.

Therefore, blockchain may be able to provide benefits for both public and private companies, as its applicability tends to be vast with several uses that could be beneficial in some way, where companies and even governments can use it in their projects in a way to bring greater speed, quality, greater security and mainly lower costs, when applied correctly in projects, being able to raise the level and bring processes into the technological era.

This article used a literature review as a research methodology and aims to identify the strategies used by organizations in using blockchain, the problems and difficulties they face, and how the use of blockchain technologies can help in the public and private corporate area, understanding its concepts and importance for Brazilian organizations and society.

## **LITERATURE REVIEW**

Here a theoretical context will be addressed so that it is possible to establish principles, challenges, and benefits of the application of blockchain by public and private companies, listing essential knowledge for professionals in organizations so that it becomes possible to better understand the function of blockchain in the public organizational context. and private, in a way that brings a pertinent and extremely relevant contextualization given the technological world we are experiencing, where there are several technologies that can be used by

organizations to improve their processes, products and services, with blockchain being one of these important technologies for organizations use in their day-to-day operations, whether internal or external, blockchain can make them more efficient and safer, and can be extremely relevant for better economic and social development.

Therefore, it is necessary to know the applicability of blockchain technology in organizations to better understand how it can impact business, highlighting and analyzing its strategies, challenges and benefits in addition to its use in the corporate area in order to identify opportunities for applying the technology and the benefits of these strategies when used correctly in public and private companies so that it generates the benefits expected by organizations.

## **BLOCKCHAIN STRATEGIES USED BY ORGANIZATIONS**

Using good strategies can be extremely important for organizations to remain profitable and overcome their challenges, so companies must implement strategies so that they can streamline processes to reduce time and costs, ensure greater security and generate greater trust for their consumers.

Given this aspect, there is a need for companies to use blockchain as a strategy, because according to Pimazzoni (2021), blockchain technology brings possibilities for improvements in electronic transactions and organizational processes between companies, such as reducing costs in operations and eliminating of bureaucratic processes.

But what is blockchain? Swan defines blockchain as:

The blockchain is a worldwide decentralized public ledger for the registration, acknowledgment, and transfer of all assets and societal interactions, a society's public records bank, an organizing mechanism to facilitate large-scale human progress in previously unimagined ways. (Swan, 2015, p. 92).

Organizations can use blockchain technology to formulate strategies and use them to promote their own development, so below some blockchain strategies adopted by companies will be listed.

### **Blockchain data Storage and Management**

Storing data and/or documentation can bring several challenges to companies, so this is a strategy that can guarantee greater agility, quality and security for organizations and customers.

The Holberton School is a school that offers an alternative education to university courses in San Francisco in the United States and has used blockchain as a way of storing and making certificates issued to students available to prevent counterfeiting of certificates, being generated a decentralized identification number for paper copies (Holberton School, 2015).

The Massachusetts Institute of Technology (MIT) is another company in the educational sector that has been adopting blockchain to issue certificates through a project that has a set of tools that enable the management and storage of certificates digitally, where they can verify who and by whom it was issued and make the certificate validation (MIT Media Lab, 2015).

Thus, by using this strategy, companies can have greater reliability towards the market and their customers, preventing fraud from being carried out in their documents and in their customers' documents, this can generate more trust, transparency, and credibility, which makes this strategy very beneficial for companies.

### **Bitcoin as a Payment Method**

Many companies may not be willing to make large investments immediately in blockchain technologies, so IBEF-SP (2019) emphasizes that the bitcoin cryptocurrency was the first use of blockchain, so it is currently quite widespread and is starting to be implemented. of the blockchain using bitcoin as a payment method is a strategy that minimizes risks as the participation of third parties is eliminated.

According to Binance (2022), some large companies already use cryptocurrencies as a form of payment, such as PayPal, which has allowed transactions with bitcoin since 2014, Microsoft, which has also accepted payments for games and applications since 2014, and Starbucks, which uses since 2020, bitcoin has been used to recharge Starbucks cards with the aim of expanding payment methods.

Still according to Binance (2022), there are some reasons why companies are starting to adopt bitcoin and other cryptocurrencies as a payment strategy, because it is cheaper than traditional payment systems, because it is faster, allowing companies and customers to connect instantly globally, enabling worldwide expansion, as it is 'cool', as it brings benefits such as appearing to be a modern brand that follows trends, and finally, offering better interaction between companies and customers, with more payment options, greater flexibility avoiding loss of potential sales.

In this way, it is possible to identify that companies use bitcoin as a payment strategy to avoid losing potential customers, as well as to avoid third-party fees, have greater flexibility with transactions, thus reducing costs and transaction time to obtain greater profits. and please customers.

### **Blockchain as a Strategy in Financial Services**

Companies that offer financial services in the market today may have several aspects that make them more dependent on third parties to deliver products and services to their customers, which may lead to longer deadlines and even inefficiency in delivery.

According to *Banco Votorantim* (2023), blockchain has a very positive impact where there will be gains for both parties in transactions, where the customer has greater security in their information and in the transactions, they carry out. Thus, *Banco Votorantim* states that they use blockchain in various operations they carry out and thus ensure that customer data is secure, thus considerably reducing the risk of leaks, as well as possible intrusions and deviations in their systems.

Thus, it is possible to verify that the use of blockchain in financial services seems to be essential, especially in the case of financial institutions such as banks, as it guarantees its own security along with the security of customers, benefiting both.

### **Blockchain in the Supply Chain**

Neto, Filippi & Guarnieri (2022) say that blockchain can be used in the supply chain aiming to take advantage of the technology to establish a logistics process that is efficient and effective with the lowest possible costs.

Embrapa (2020) conducted an innovative research project in the sugarcane sector's production chain, where a technical partnership was made with the São Paulo State Sugarcane Planters' Cooperative (Coplacana), Safe Trace, together with Usina Granelli (Sugar and alcohol plant), aiming to use blockchain to provide greater market gain.

Also, according to Embrapa (2020), blockchain technology can be used throughout the production chain, from raw materials, industrialization, and commercialization, being capable of recording, storing, organizing, tracking, and making available all collected information. throughout the chain, from its implementation in the field to the final stages, ensuring product quality and creating a reliable data environment distributed among everyone participating in the chain.



Thus, we can identify that the strategy of using blockchain in the supply chain can guarantee the best development of all processes in the chain with more accurate data and fewer errors so that it is possible to achieve savings in the chain at the same time quality the product be guaranteed for customers.

## **PROBLEMS AND CHALLENGES FACED IN USING BLOCKCHAIN**

After listing some blockchain strategies adopted by companies, we can identify the great potential of this technology for all organizations present around the world, regardless of their size or investment power. However, this technology also has its own problems and challenges to be overcome in its use, which must be analyzed carefully by organizations.

According to Alkudmani (2020) through the Bitcoin Portal, he emphasizes that one of the main challenges that the use of blockchain has is its immaturity and within this challenge we have some problems such as usability and scalability. Therefore, companies that use or intend to use this technology must pay attention to these problems.

Tapscott & Tapscott (2017) identify scalability and usability as blockchain problems by stating that bitcoin does not have the ability to generate security in the usual massive growth, so blockchain technology could suffer from capacity problems, failures and unpredictability of bugs. For ordinary users, blockchain interfaces may not be very friendly, requiring a high tolerance for the codes used by the technology.

Therefore, companies that adopt blockchain in their processes or use it to carry out transactions directly with customers must have this knowledge of scalability and usability when accomplish implementations in their process.

Another problem that companies may face when using blockchain is its environmental impact on the planet, as according to the Bitcoin Energy Consumption on the Digiconomist (2023) the total annualized carbon footprint of the bitcoin blockchain reaches 55.34 Mt CO<sub>2</sub>, while electricity reaches a consumption of 99.22 TWh, and electronic waste reaches 55.37 kt, which is comparatively like the consumption of some countries. This can cause numerous environmental concerns and even drive away customers and suppliers looking for more sustainable processes and/or products.

A problem that companies may face when using blockchain is security and crime, which may affect the interest of people and companies in this technology, as according to Alkudmani (2020) even though blockchain systems are safer compared to computational structures conventional, hackers may still be able to penetrate the systems of companies that use

blockchain. Moura (2021) states that by not having standards that establish blockchain, the technology may not provide the security that companies desire, much less the perception of security for its users.

Thus, it is possible to identify that blockchain technology, in addition to its advantages, has several challenges that companies face or have already faced after its implementation, because even if blockchain is more secure, it is still not 100% and can be subject to attacks, generating dissatisfaction with the pollution generated by technology and not having the necessary scalability for the continuous development of organizations.

### **BLOCKCHAIN TECHNOLOGIES TO HELP THE CORPORATE AREA**

Although blockchain has challenges to be overcome in its use, in the corporate area this technology can help private companies in resolving various processes. Porto, Junior & Silva (2019) emphasize that a way for blockchain to assist in the corporate area would be through business companies as well as in corporate law, mainly in holding general assemblies, being useful in resolving various flaws, such as high costs in holding assemblies. Given all the requirements such as publication in major newspapers and expenses with shareholder travel, lack of transparency, and can also avoid behaviors that violate legality, among other non-compliances.

Also, according to Porto et al. (2019), meetings, in addition to having high costs, end up not having a large participation of shareholders. Elst & Lafarre (2017) resolves this issue by stating that blockchain brings a decentralized form that provides a revolution in shareholder meetings, offering several advantages such as: more efficient decision-making in a decentralized way with reduced voting costs, providing a more organized and more conducive meeting of shareholder participation.

Divino (2018) says that smart contracts can also be inserted into the blockchain, functioning as a database to manage information, so all clauses are encoded and integrated into the blockchain.

In this way, we can see that the use of blockchain by the corporate area of private companies can assist in their meetings, effective shareholder participation, more efficient decision-making, and smart contracts, thus providing a way to better manage corporate processes.



According to Rodrigues (2018) through TCE-GO, he says that blockchain in the public sector can help reduce fraud, assist in the supervision and audits of government accounts, allowing the acceleration of processes and consequently more agile transactions almost in real time.

Rodrigues (2018) through TCE-GO goes further stating that blockchain can be used to control income and expenses by defining spending rules and who would make decisions about these expenses. With the blockchain, the courts of accounts will be able to automate audits and conduct the services carried out by the public manager in real time, to make available to society the methods used to calculate all the money that was spent on health, education, among many others expenses required by law.

Therefore, this technology can provide better control of operations in the public corporate area by ensuring that various aspects are worked on in an integrated manner so that better communication is generated with different bodies, whether federal, state, or municipal bodies, thus providing greater transparency. towards citizens.

## **BLOCKCHAIN APPLIED IN BRAZILIAN PUBLIC AND PRIVATE COMPANIES**

After highlighting some aspects of blockchain technology for organizations in a theoretical way, it will now be discussed in practice how it benefits public and private organizations present in Brazil, because as evidenced in theory, blockchain has several benefits, but do these benefits apply in organizations? Are there already companies using this technology? Seeking to respond to these and other objectives already established initially, four Brazilian companies will be analyzed, two from the private sector and two from the public sector, so that it is possible to establish the benefits of blockchain technology in practice.

## **BLOCKCHAIN APPLIED IN PRIVATE COMPANIES**

We start with private companies, where we have two digital banks that have been applying blockchain technologies in their processes, products, and services, these being *Banco Inter* and Nubank, where through their investments they enable their customers to invest in cryptocurrencies on their platforms.

### **Blockchain and *Banco Inter***

*Banco Inter*, according to Martins (2023), formed a partnership with the company B3 digital to provide cryptocurrencies for customers to have more investment options within the bank. According to Brazil Journal (2023), in an interview with Felipe Bottino, director of Inter

Invest, he emphasized that the bank now offers direct investment in cryptocurrencies to attract people who already use and invest in cryptocurrencies on other platforms to its base.

According to Rocha (2023) in an interview with Renan Pontes, executive manager of investment operations at Inter Invest, he states that the main objective of offering investments in cryptocurrencies is to provide greater ease in acquiring these assets, providing a more spontaneous acquisition for bank users. Below is a table showing the reasons for investing in cryptocurrencies according to Inter Invest.

Table 1. Reasons to invest in cryptocurrencies at *Banco Inter*.

Advantages for customers	Description
Valuation potential	Cryptocurrencies have a history that presented very pertinent valuations, where they generated significant returns for some investors.
Diversification of investments	By being independent of other assets, cryptocurrencies can help minimize investment risks.
Worldwide access	Being decentralized, cryptocurrencies allow investment and transactions from anywhere in the world.
Small fees in transactions	When compared to traditional transactions, cryptocurrencies have significantly lower fees.
Democratization of investments	Possibility to start investing with just R\$1, democratizing investments for the neediest population, given that Brazil is still an emerging country, this can be a lever for the democratization of investments for the population in general.

Source: Adapted from *Banco Inter*, 2024.

Table 1 highlights the importance of investing in cryptocurrencies for customers according to Banco Inter itself, showing its vision of blockchain through cryptocurrencies for its customers and potential customers, seeking to highlight the benefits that blockchain technology provides, aiming for understanding of these assets by customers so that they decide to make this type of investment on their platform.

Having highlighted the importance of blockchain for customers according to Banco Inter through the advantages highlighted above in Table 1, now through this it is possible to list the reasons why Banco Inter idealized this type of investment, thus, the benefits that the bank has are highlighted below when making investments in cryptocurrencies available to its customers.

Table 2. Benefits of blockchain for *Banco Inter*.

Benefits for <i>Banco Inter</i>	Description
Greater customer attraction and retention	Through investing in cryptocurrencies, <i>Banco Inter</i> can attract and retain new customers for this investment, especially if it is more attractive than its competitors.
Largest customer base	With a larger customer base, the bank will be able to offer other products and services present on its platform, thus increasing its profitability when offering this type of investment.
Value generation	By having diversified assets and especially assets that are independent of governments, this can generate greater value for the bank, as decentralized technology can generate greater trust for customers.
International expansion	Carrying out internationalization may not be an easy task, however the use of cryptocurrencies can facilitate this process for the bank, as while applying investments present in one country to another can present a certain complexity, investments in cryptocurrencies can be an initiator of the international operations of the bank. <i>Banco Inter</i> because it is decentralized and not backed by any government.

Source: Prepared by the author, 2024.

In this way, it is possible to understand the benefits of using blockchain through cryptocurrencies for both customers and the bank, as by investing in this technology Banco Inter will be able to generate greater value for its business given the greater availability of customers and the diversified of the forms of investments that can be more attractive than traditional ones for customers, while promoting and generating new possibilities for their continued development.

Souza and Medeiros (2020) agree with these benefits evidenced by stating that cryptocurrencies have as fundamental attributes the fact that they are decentralized and can provide greater anonymity for their users. Santos, De Souza, and Da Costa (2021) complement by emphasizing that cryptocurrencies have other benefits such as the security obtained in a virtual environment and the elimination of bureaucracy in processes, which can reduce errors and speed up operations when used well.

Therefore, technology serves to meet people's needs while generating profitability in some way for organizations, therefore the applicability of investments made available by Banco Inter through cryptocurrencies becomes a transformative agent not only in business, but throughout society, given its capacity for democratization and easy use for all income groups, providing the entire population with the possibility of investing small amounts, so that a dream can be realized through better financial management through investments.

This is to generate value, bring satisfaction and new possibilities to customers, this can transform lives and transform businesses, thus generating the benefits presented for Banco Inter

in Table 2, demonstrating the strength that blockchain through cryptocurrencies has for both business itself, as well as for society.

This shows that the use of blockchain by private companies has benefits that align with the theory previously highlighted, showing that when blockchain technology is actually applied to business it has great capacity to transform business as a whole, demonstrating that blockchain is a technological tool that should be used by organizations, whether through cryptocurrencies as in this case, or in any other process in which blockchain can be used so that it can generate better results for organizations.

### Blockchain and Nubank

Among the banks, it is not only *Banco Inter* that uses blockchain technology, as in this segment we have Nubank that also uses this technology through cryptocurrencies, where its cryptocurrency investment platform is called Nubank Cripto. In this way, Nubank offers cryptocurrency assets to its customers. According to Nubank (2022), this platform is a solution to buy and sell cryptocurrency assets in a democratic way for those interested in the platform, where in a few months after its implementation it already had more than 2 million users who made at least one purchase of cryptocurrencies.

Compared to *Banco Inter*, Nubank also offers the possibility of buying fractions of coins, also bringing the benefit of democratization to decentralized investments, but Nubank itself brings other aspects that we expressed in the Table 3 below, which shows the benefits for customers who invest in Nubank Cripto.

Table 3. Benefits of investing in Nubank Cripto.

Benefits for customers	Description
Greater practicality	You buy directly from the bank's own application, where you can manage all crypto assets.
Convenience	Transfer at any time or day of the week using the existing balance in your account.
Direct purchase	Buy, sell, or transfer cryptocurrencies directly in the application, without the need to use external platforms or having to create additional accounts.

Source: Adapted from Nubank, 2022.

This demonstrates that the company is strictly concerned with its customers, where it wants its customers to have more functionalities within its platform to generate greater engagement with its services and products present in the bank's application, providing greater efficiency in use, greater engagement with customers and greater ease of investment.

On the other hand, these benefits for customers also generate benefits for the company, as previously evidenced, within a few months of launching investment in cryptocurrencies, it already had more than 2 million active users buying or selling cryptocurrencies on the platform, showing that technology It can generate greater profitability for companies, as these users pay low fees to buy and sell these assets, in addition to being able to direct these customers to other services, generating greater engagement with the institution and, as a result, greater profitability. Therefore, Table 4 below presents the benefits of using blockchain through investments in cryptocurrencies for Nubank.

Table 4. Benefits of blockchain for Nubank.

Benefits for Nubank	Description
Greater profitability	Having more investment options, mainly through a space dedicated only to cryptocurrencies in the case of Nubank Cripto, generates greater profitability by concentrating everything in the same application, where they generate returns through transactions, while providing greater engagement with other products and services of the bank and can generate greater profitability.
Greater customer engagement and retention	As everything is present in one place, it is easier to direct a customer to a specific area of the application, making them engage with other content.
Social and economic development	By using decentralized investments that bring the possibility of investing with little, the bank brings in a public that was previously unthinkable as an investor, generating benefits for society while increasing its economic value.

Source: Prepared by the author, 2024.

In this way, it is possible to identify that in the strategic scope of blockchain through cryptocurrencies, it has great capacity to generate benefits for organizations, as well as for customers who use the services provided by companies through this technology, that is, everyone benefits, both society and organizations, as this technology helps bring new investor profiles to banks, providing greater profitability and a new range of products and services, it helps transform the economy, where people can now invest with little, without worrying about because the currency invested is decentralized, and most importantly it has greater chances of appreciation, and can be much greater than the commonly used backed assets, developing both the business and society around the company.

Both banks identified here benefited and benefited customers with blockchain through cryptocurrencies, where it is possible to identify the importance of its use for business and society, as it can transform lives, businesses and even the economic when implemented and used correctly by users of this technology. Therefore, it has these and other benefits that can be explored by any type of business, where in addition to this applicability in cryptocurrencies, it has countless others that can and should be explored by organizations so that they can achieve

their objectives and continue to develop as they the world continues to transform, aiming to obtain greater profitability.

## BLOCKCHAIN APPLIED IN PUBLIC COMPANIES

Having highlighted the use of blockchain in private companies, it will now be possible to understand how this technology can also be used in public companies. To this end, its implementation in two Brazilian public companies will be listed so that it is possible to understand how its implementation and use works, to understand its usefulness and benefits both for public organizations and for society.

### Blockchain and *Banco do Brasil*

*Banco do Brasil* is one of the main traditional Brazilian banks with millions of customers across the country, and it is a great responsibility to manage these countless accounts safely and at the lowest possible costs. To have better financial management, it sought to apply blockchain in its operations.

According to the *Tribunal de Contas da União* (2020), the Digital Financial System (SFD) was used for this implementation, which uses blockchain in its composition, enabling financial transactions to be facilitated with the capacity to carry out 2,400 transactions per second. To better understand the functionalities of this technology applied to *Banco do Brasil*, Table 5 below highlights some of its functionalities.

Table 5. SFD functionalities with blockchain at *Banco do Brasil*.

Functionalities	Description
Immediate transfer And simplified	<i>Banco do Brasil</i> will be able to carry out complete transactions in seconds, that is, immediately and in a simplified manner for its customers.
Batch settlement And secrecy	It can settle multiple batches of transactions per second, ensuring data confidentiality with data encryption.
Simplification	Legal entities also have greater simplification in transactions, with greater ease, use of QR CODES for physical stores and e-commerce, in addition to 24/7 availability.

Source: Adapted from *Tribunal de Contas da União*, 2020.

In this way, it is possible to identify the functionalities that this technology offers to customers and society when applied in a banking financial system, where it has the capacity to bring greater security to transactions carried out while allowing its use 24 hours a day, 7 days per week, providing greater agility for customers, as people want to do everything as quickly



as possible, so when technology provides this ease in people's lives it can bring these and other benefits, not only to the bank's customers themselves, but also generate benefits for the bank itself, as it invests in technology expecting a return, that is, it uses blockchain to benefit customers and expects these benefits to also be reflected for its own benefit.

The *Tribunal de Contas da União* (2020) brings the benefits of implementing this technology used in the financial system to reduce the cost of paper money, as this cost in 2017 approached R\$89 billion (values in Brazilian reais), also with This technological application is expected to reduce transaction times and fees incurred, as well as lower cash costs, reducing the need to print banknotes.

Therefore, when blockchain is applied to a bank's financial system, it can increase the company's operations, as it provides a reduction in costs while bringing the possibility of carrying out a greater number of transactions, which in turn can generate more profitability, while customers have greater convenience in their daily lives with faster, easier, and safer financial operations. In this way, blockchain technology provides an advancement for the entire economy and society.

### **Blockchain at BNDES – *Banco Nacional de Desenvolvimento Econômico e Social* (National Bank for Economic and Social Development)**

After identifying the application of blockchain at *Banco do Brasil*, its application at another bank will now be highlighted, but this time in a more expressive way, as BNDES brings this technology through its own token called BNDES TOKEN, where according to the *Tribunal de Contas da União* (2020) this project aims to create a DLT and a cryptocurrency backed by real for credit operations for public and private companies through financing, allowing the entire society to be aware of all transactions carried out by the bank.

Therefore, Table 6 is presented below, which contains other features that this crypto asset can employ in its use.

Table 6. Blockchain through active crypto at BNDES.

Functionalities	Description
Backed cryptocurrency	Given that BNDES is a bank intended for legal entities, this functionality is essential to monitor transactions with greater security and speed.
Smart Contracts	This BNDES solution also includes its use through smart contracts so that it is possible to guarantee the development, transfers and sharing of cryptocurrencies.
Less bureaucracy	This technology has the capacity to digitize all processes and can disconnect banks that mediate transactions.

Greater transparency	This is an essential functionality today, as increasing the transparency of operations is essential for monitoring processes by responsible and interested bodies, as well as by society, as blockchain technology is used and has all its decentralization characteristics.
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Source: Adapted from *Tribunal de Contas da União*, 2020.

After highlighting the functionalities of using blockchain for the BNDES, it is possible to understand that its use can be essential, both to generate more security in transactions for companies taking financing, and to bring greater transparency in transactions, which can lead to a reduction in errors, fraud, and corruption, in addition to providing crypto-active companies and customers with more security and less bureaucracy.

The *Tribunal de Contas da União* (2020) further emphasizes that this token can generate greater trust with citizens, especially in public processes, given its transparency, audibility, and ability to monitor public processes, as anyone can have access to the smart contract code.

In this way, it is possible to state that blockchain technology is very important for both public and private companies, as it has numerous benefits when applied to financial processes and transactions, providing lower costs, fewer errors, greater transparency, less bureaucracy, more efficiency, and agility by reducing time used, leading to greater profitability. Where the entire society if benefits from these applications, also reaping some of these benefits, in this way, blockchain proves to be essential so that both companies and society can have better economic and social development.

## METHODOLOGY

This article aimed to provide a synthesis of the use of blockchain technology for both public and private companies, highlighting some of the strategies that can be used by them when using blockchain, as well as some of the challenges and difficulties that permeate its implementation, where its functionalities and benefits for companies and the society where they are present were highlighted.

To this end, this article was made up of two parts, where general theoretical aspects were first highlighted to support the initially proposed objectives, where very relevant aspects for its development were highlighted, pointing out statements from external authors through citations and bibliographical references.

Moving on to the second part, this article was based on text research to identify public and private companies that already use blockchain technology in their operations with a view

to identifying whether the previously mentioned benefits could materialize in practice, where for this were evidenced four banks present in Brazil, two private banks and two public banks.

To make it possible to understand the use of these technologies and their real benefits both for their applicators and for the society around them, this research was carried out through bibliographical references, with analysis of relevant texts to highlight the objectives raised and discussed, therefore this article It was exploratory research.

According to Taquette & Borges (2020) exploratory research seeks to provide information to lead the development of hypotheses, which involves the elaboration of studies to provide the researcher with knowledge about what is being researched, seeking to discover, find and/or elucidate facts that are not understood, even if are clear.

## **RESULTS AND DISCUSSION**

After highlighting important aspects for the survey and discussion of the objectives, very relevant conclusions were reached on the issues highlighted, where strategies, challenges, and opportunities for implementing blockchain for all types of companies were identified, listing the survey of some companies in the relevant banking sector in the Brazilian scenario and that make use of blockchain in their businesses.

Therefore, this research managed to assert itself and sustain itself through the objectives established at the beginning of this, bringing enlightening and relevant aspects to the economic and social context in the location of these companies, where it was possible to establish the capabilities of this technology when applied correctly by its users.

In this way, this research was carried out based on bibliographical aspects, as it was the most viable and relevant path to meet the research objectives, whereby this is not a unique or totally exclusive method so that the same results can be achieved here. obtained, and other methods and even other tools can be used to complete it.

## **CONCLUSION**

The use of blockchain technology is becoming more important every day for people, companies and governments, as it is transforming the way we carry out some transactional operations, making them safer, faster and more practical in their use, thus companies of any size can use this technology in their operations, thus it was demonstrated that companies can use different strategies to implement blockchain technology in their operations, benefiting many of their areas and becoming more attractive to the market.

After listing the blockchain strategies used by companies, it was possible to highlight their benefits, however, we identified that this technology has problems and challenges that companies must overcome when using it, and must understand very well the technology to be implemented, therefore it was also identified as this technology helps in the public and private corporate area, so in the end we can understand how much blockchain technology, even with its challenges, can benefit organizations through the strategies used, and governments through better public management, which can benefit the entire society.

By analyzing how blockchain technology operates within public and private companies, it was possible to establish that it is increasingly present in society and that it has several benefits for it, as while in private companies it operates bringing greater profits, lower costs, greater speed, greater engagement with customers, and more possibilities for payments and investments, in public companies it works by generating greater reliability of operations, greater transparency, the possibility of auditing transactions, reducing fraud and corruption, among many other benefits.

In the end, it was possible to understand the need to use blockchain for companies and people, because as companies implement blockchain, its functionalities permeate the entire society where these companies are present, and can even transform it for the better, therefore companies that use blockchain in their operations guide economic and social development in the countries where they are present, in the case of the companies mentioned here, they have the capacity to transform the development of Brazilian society and economy, if implemented and used correctly by companies.

As limiting aspects of the research carried out, it is possible to see that despite meeting the proposed objectives, it's not actually delve into the implementation of blockchain within companies, where it focused only on the benefits and challenges according to authors and on the benefits according to disclosures from the analyzed companies themselves, not delving into its internal aspects of implementation, it also did not focus on quantitative studies, having this as a limiting factor. Another limiting factor is the focus only on the benefits of the companies analyzed. Therefore, for future research, it will be interesting to analyze these, seeking more emphasis on the subject to understand the internal actions of organizations on blockchain technology, thus carrying out quantitative empirical research with companies to add to this research.

## REFERENCES

- Alkudmani, F. (2020). *Os três principais desafios enfrentados pela tecnologia blockchain e criptomoedas em 2020*. Available in: <https://portaldobitcoin.uol.com.br/os-tres-principais-desafios-enfrentados-pela-tecnologia-blockchain-e-criptomoedas-em-2020/>.
- Alves, P. H.; Laigner, R.; Nasser, R.; Robichez, G.; Lopes, H.; & Kalinowski, M. (2020). Desmistificando Blockchain: Conceitos e Aplicações. In Maciel, C.; and Viterbo, J., editor(s), *Computação e Sociedade*, 22, pages 166-197. *Sociedade Brasileira de Computação*, 2020. ISBN: 978-6-555-88048-9. Available in: <https://bibbase.org/network/publication/alves-laigner-nasser-robichez-lopes-kalinowski-desmistificandoblockchainconceitoseaplicaes-2020>.
- Banco Votorantim. (2023). *Blockchain no mercado financeiro: Entenda os impactos da inovação*. Available in: <https://www.bv.com.br/bv-inspira/inovacao/blockchain-no-mercado-financeiro>.
- Banco Inter. (2024). *Negociar criptomoedas no Inter é simples*. Available in: <https://inter.co/pra-voce/investimentos/criptomoedas/>.
- Brazil Journal. (2023). *Inter entra em cripto para fidelizar clientes*. Available in: <https://braziljournal.com/inter-entra-em-cripto-para-fidelizar-clientes/>.
- Binance. (2022). *6 grandes marcas que aceitam Bitcoin e seus motivos*. Available in: <https://www.binance.com/pt-BR/blog/payment/6-grandes-marcas-que-aceitam-bitcoin-e-seus-motivos-421499824684903357>.
- Digiconomist (2023). Bitcoin Energy Consumption Index. Available in: <https://digiconomist.net/bitcoin-energy-consumption>.
- Embrapa (2020). *Pesquisa agropecuária usa blockchain para rastrear cadeia de cana-de-açúcar*. Available in: <https://www.embrapa.br/busca-de-noticias/-/noticia/57896694/pesquisa-agropecuaria-usa-blockchain-para-rastrear-cadeia-da-cana-de-acucar>.
- Divino, S. B. S. (2018). Smart Contracts; Conceitos, Limitações, Aplicabilidade e Desafios. *Revista Jurídica Luso-Brasileira*, 2776. Available in: [https://www.cidp.pt/revistas/rjlb/2018/6/2018\\_06\\_2771\\_2808.pdf](https://www.cidp.pt/revistas/rjlb/2018/6/2018_06_2771_2808.pdf).
- Elst, der C. V. & Lafarre, A. (2017). Bringing the AGM to the 21st Century: Blockchain and Smart Contracting Tech for Shareholder Involvement. *European Corporate Governance Institute (ECGI) – Law Working Paper No. 358/2017*. Available in: <http://dx.doi.org/10.2139/ssrn.2992804>.
- Holberton School. (2015). Holberton School to Authenticate Its Academic Certificates with the Bitcoin Blockchain. Available in: <https://www.globenewswire.com/news-release/2015/10/21/969239/0/en/Holberton-School-to-Authenticate-Its-Academic-Certificates-With-the-Bitcoin-Blockchain.html>.
- Martins, L. G. (2023). *Banco Inter libera compra e venda de Bitcoin, Ethereum e mais 3 criptomoedas*. Available in: <https://www.infomoney.com.br/onde-investir/banco-inter-libera-compra-e-venda-de-bitcoin-ethereum-e-mais-3-criptomoedas/>.

Mit Media Lab. (2015). Certificates, Reputation, and the Blockchain. Available in: <https://medium.com/mit-media-lab/certificates-reputation-and-the-blockchain-ae03622426f#hf5ur1fir>.

Moura, F.V. (2021). *Desafios para implementação do Blockchain: Parte II*. [e-book] Flórida: Must University

Neto, da Silva, F. J.; Filippi, G. C. A. & Guarnieri, P. (2022). *Perspectivas de blockchain em uma cadeia de suprimentos agroalimentar*. Available in: <http://dx.doi.org/10.3895/rts.v18n52.14133>.

Nubank. (2022). Nubank Cripto: *solução para comprar e vender criptoativos ganha mais duas moedas digitais*. Available in: <https://blog.nubank.com.br/nubank-cripto-novas-criptomoedas/>.

Pimazzoni, E. E. (2021). Blockchain no setor elétrico brasileiro: desafios da permissionless innovation. 92 f. *Dissertação (Programa de Pós-Graduação em Administração) – Universidade Nove de Julho, São Paulo*. Available in: <http://bibliotecatede.uninove.br/handle/tede/3055>.

Porto, A. M.; de Lima Junior, J. M., & Silva, G. B. (2019). Tecnologia Blockchain e Direito Societário: aplicações práticas e desafios para a regulação. *Revista de Informação Legislativa*, 56(223), 11-30. Available in: [https://www12.senado.leg.br/ril/edicoes/56/223/ril\\_v56\\_n223\\_p11.pdf](https://www12.senado.leg.br/ril/edicoes/56/223/ril_v56_n223_p11.pdf).

Rodrigues, B. J. (2018). *A Aplicação da Tecnologia Blockchain no Setor Público – Uma Análise Preliminar*. TCE-GO. Available in: <https://portal.tce.go.gov.br/documents/20181/327476/A%20Aplica%C3%A7%C3%A3o%20da%20Tecnologia%20Blockchain%20no%20Setor%20P%C3%ABlico/1474322b-19f0-417a-9a71-65462194fd6d>.

Rocha, B. (2023). *Banco Inter entra no mercado cripto. Veja as moedas disponíveis*. Available in: <https://investidor.estadao.com.br/ultimas/banco-inter-permite-negociacao-criptomoedas/>.

Santos, A. P. M., De Souza, P. H. P., & Da Costa, T. R. M. (2021). *As criptomoedas/moedas digitais se tornarão as moedas do futuro?* Available in: <https://repositorio.animaeducacao.com.br/bitstreams/83d395a0-ef06-4169-b5af-ad155e189fab/download>.

Souza, E., & Medeiros, M. de L. (2020). Criptomoedas e suas aplicações no mercado turístico. *Marketing & Tourism Review*, 5(1). <https://doi.org/10.29149/mtr.v5i1.5877>.

Swan, M. (2015). *Blockchain: blueprint for a new economy*. Sebastopol: O'reilly. ISBN: 9781491920497.

Tapscott, D. & Tapscott, A. (2017). *Blockchain revolution*. São Paulo: SENAI-SP Editora. ISBN: 8583937893.

Taquette, S. R., & Borges, L. (2020). *Pesquisa qualitativa para todos*. Petrópolis: Vozes. ISBN: 9786557130346.

Tribunal de Contas da União. (2020). *Aplicações Blockchain no setor público no Brasil*. Available in: [https://portal.tcu.gov.br/data/files/58/02/CE/5E/C4854710A7AE4547E18818A8/Blockchain\\_apendice1.pdf](https://portal.tcu.gov.br/data/files/58/02/CE/5E/C4854710A7AE4547E18818A8/Blockchain_apendice1.pdf).