An Overview of Blockchain Technology, Focusing on the Characteristics of the Blockchain Process

Georgia Parastatidou
Democritus University of Thrace

Vassilios Chatzis
Democritus University of Thrace

The objective of this literature overview is to examine the importance of blockchain technology in business and administrative applications. It analyzes the progress of blockchain technology applications, comparing articles from the fields of business, management, and accounting mainly from 2019 to 2023. The review identifies common conceptual phrases used by many authors to highlight the fundamental characteristics of blockchain processes. These include the permanent transfer of resources, data integrity, immutable duration, and elimination of third-party control. The use of smart contracts in blockchain processes drives business innovation. This can reduce asymmetric information, increase transparency, enhance the ability to enter into reliable contracts and minimize transaction costs, all of which contribute to higher levels of competition. Presenting findings resulting from knowledge of the technology can help companies and organizations make informed decisions about whether to adopt or reject blockchain applications. This study reveals the idea that the transparency of blockchain could form the basis for new innovative business models and explores the potential of blockchain technology's transparency to develop novel business models.

Keywords: blockchain technology, innovation, technological change, information processes, business value

INTRODUCTION

The text discusses the use of blockchain technology for the transparent and secure dissemination of information and explores the evolution of blockchain services in the business world, highlighting their notable use in information systems (Papathanasiou et al., 2020; Berdik et al., 2021) in the context of digital transformation.

The increased use of global networks and the proliferation of products and services have resulted in multiple parties being involved in information transfer processes, creating numerous opportunities for errors to occur. The lack of confidence in information trading has prompted businesses, consumers, governments, and citizens to recognize the significance of further digitization and the necessity of adopting innovative technologies such as blockchain to enhance data integrity and visibility (Santhi & Muthuswamy, 2022).

Typically, companies and organizations using information systems rely on third parties to perform a task and require a network of trust between stakeholders, which becomes more critical when sensitive

information is involved. Blockchain technology offers opportunities to improve and more securely integrate third-party products, while mitigating the risk of transferring sensitive information to these parties (Berdik et al., 2021). The absence of a trusted third-party intermediary in business sectors leads to cost savings, innovative business models, new revenue streams, improved transaction efficiency and increased transparency (Upadhyay, 2020). Blockchain technology can provide a suitable technology-driven starting point for designing an accountability mechanism to solve complex problems (Ajwani-Ramchandani et al., 2021; Hawlitschek et al., 2020).

This study is a literature review on the concept of blockchain technology in the business sector. The reasons why blockchain characteristics increase adoption intentions in business strategies motivated our research interest. We highlight why companies that adopt processes supported by blockchain technology can gain added value with new innovative solutions.

BACKGROUND TO BLOCKCHAIN TECHNOLOGY

In blockchain technology, the transaction record of the system is maintained in multiple distributed peer-to-peer nodes connected in a peer-to-peer network (Viriyasitavat and Hoonsopon, 2019). Blockchain is a decentralized ledger technology (DLT) that secures data through cryptographic techniques (Latif et al., 2021). It is a complex technology at the intersection of computer science, cryptography, and finance. Blockchain technology is based on five principles: decentralization, peer-to-peer (P2P) transmission, pseudonym transparency, irreversibility of records, and computational logic (Toufaily & Zalan & Dhaou, 2021).

Blockchain Technology Evolution

Blockchain was created in 2009 by Satoshi Nakamoto with the concept of cryptocurrencies. Bitcoin was a digital currency without the control of governments, banks, and other traditional financial institutions. From 2010 to 2011, blockchain technology refers to the market of virtual digital currencies, such as currency transfer and payment systems. In 2012 and 2013, innovative companies and organizations began to use bitcoins to accelerate payments and transactions between customers and merchants via mobile devices. In 2013, the Ethereum project launched, allowing users to use smart contracts and automate business processes providing applications in other areas such as financial markets, futures, loans, promissory notes, and liquidation of financial assets. In 2014, more ideas were developed to promote innovation and fintech through blockchain technology. In 2016, blockchain was considered one of the candidate technologies capable of disrupting traditional business systems, financial services, and government affairs. In 2017, blockchain technology expanded and began to connect with other concepts such as platforms, networks, and services, revealing capabilities for actions such as data decentralization, removal of intermediaries, and automated transaction execution. These capabilities allowed blockchain technology to delve deeper into payments, transaction clearing, trade finance, digital currencies, equities, and risk management. In 2018, the technology began to be questioned on the issue of its maturity to replace existing systems, but efforts continued to find blockchain solutions for industry, entrepreneurship, finance, and innovation. In January 2019,a new distributed operating system was released, overcoming blockchains such as Ethereum, allowing millions of transactions per second, and combined with the Internet of Things, makes blockchain technology most suitable for issues dealing with product traceability, network security and contracts (Kumar, Talasila, Pasumarthy, 2021; Pan et al., 2020; Liu & Li, 2020; Janssen et al., 2020; Perdana et al., 2021; Frizzo-Barker et al, 2020).

Today, blockchain technology is defined as a network infrastructure that ensures the verification of transactions through a decentralized ledger that uses asymmetric encryption schemes, timestamping, decentralization, and consensus algorithms to create it (Gao et al., 2021) and is presented as a digital ledger that facilitates all securities transactions without the need for an intermediary (Frizzo-Barker et al., 2020).

Definitions of Blockchain Technology

The terms blockchain and distributed ledger technology (DLT) are used interchangeably in both research and the media. DLT appears to be gaining traction in research over blockchain, which is favored by the media. A DLT is a database that, instead of being stored in a central location, is distributed across a network of computers. The most common type of distributed ledger technology is blockchain DLT, which is a singular term for the broader technology, whereas blockchain refers to a specific application (Perdana et al., 2021).

The authors J. Gao et al. (2021), p.3, state that "Blockchain technology is a peer-to-peer network infrastructure that uses decentralization, asymmetric encryption schemes, timestamps and consensus algorithms to create a secure decentralized ledger that ensures the verification of transactions". The authors P. Centobelli & al. (2021), p.2, unfold the concept of blockchain for the benefit of the circular economy, defining it as "a technology for a sustainable transformation of the linear economic paradigm". On the other hand, an acceptable term by J. Frizzo-Barker et al. (2020), p.1, presents blockchain as "a decentralized, digital ledger that facilitates peer-to-peer value transfers of all kinds, from digital currency to physical goods and land titles, without the need for intermediaries such as banks, accountants or lawyers". Mittal et al. (2021), p.1, have highlighted the blockchain as "a ledger that records all transactions executed, shared and verified by participating users (/nodes) in the blockchain network". A simpler term for the blockchain has been given by M. Janssen et al. (2020), p.1, as "a mechanism involving digital assets and two or more parties, where some or all of the parties contribute assets, and the assets are automatically redistributed among those parties according to a formula based on certain data that is not known at the time the contract is initiated".

Research Objectives

Researchers are interested in understanding the organizational spectrum and decision-making process for adopting blockchain technology to contribute to its diffusion as an innovation (Upadhyay, 2020). However, the technology is surrounded by hype, and many proposed ideas may not be feasible (Garrard & Fielke, 2020).

With this paper, we are interested in identifying the reasons why the academic community is focusing on blockchain technology by uncovering its characteristics. The reasons why these blockchain characteristics are driving businesses towards new innovative solutions are the motivation for our research interest. In particular, our objectives focus on understanding how the technology works for businesses and how smart contracts affect innovative solutions. By highlighting and presenting the key characteristics of the blockchain process, we aim to promote the benefits it can bring to businesses.

Report Structure

The paper is organized as follows. The next section presents the methodology used to conduct the systematic literature review. Section 4 presents the findings. Discussions and conclusions are presented in section 5, followed by a bibliography.

LITERATURE REVIEW METHODOLOGY

According to Elsevier's Scopus database, there are 533 research articles related to the phrase "blockchain in business" mentioned in the field of business, management, and accounting from 2019 to 2023.The search was also limited to research studies published in English-language journals that contained the word "information" in their title about the modern technology used by commercial departments of businesses.

To evaluate the usefulness of blockchain technology for businesses, we categorized the selected articles into thematic sections, as shown in Table 1.

The first section collected studies presenting definitions of blockchain technology, while the second section focused on smart contracts and their functionality. The third thematic section presents the

performance of the characteristic properties of the technology as reflected in the selected studies. The fourth section concludes with authors' opinions on the usefulness of blockchain technology.

TABLE 1
THEMES FOR CATEGORIZING ARTICLES

Definitive technology categories	References
How blockchain works?	Hussien et al., 2021; Ostern, Holotiuk, Moormann, 2021; Latif et al., 2021; Warkentin & Orgeron, 2020; Gao et al., 2021; Wang, Luo, Lee, 2019; Nóbrega et al., 2021; Karamchandani, Srivastava, Srivastava,2020; Viriyasitavat & Hoonsopon, 2019; Nanayakkara et al., 2021; Viriyasitavat, Hoonsopon, Bi, 2021; Helliar et al., 2020; Pan et al., 2020; Benedict & Gill, 2021; Tönnissen & Teuteberg, 2020; Toufaily, Zalan, Dhaou, 2021; Chen et al., 2020; Di Vaio & Varriale, 2020; Ciriello, 2021; Kamble, Gunasekaran, Sharma, 2020; Queiroz, Samuel Fosso Wamba, 2019;Upadhyay et al., 2020; Perdana et al., 2021; Schlatt et al., 2021; Frizzo-Barker et al., 2020; Salcedo & Gupta, 2021;Centobelli et al., 2021; Völter, Urbach, Padget, 2021; Liu & Li, 2020; Janssen et al., 2020; Scholl & Bolívar, 2019; Powell et al., 2021; He, Zhang, Li, 2021; Weigand et al.,2020; McCallig, Robb, Rohde, 2019; Vincent, Skjellum, Medury, 2020; Yen & Wang, 2021; Diller, Asen, Späth, 2020; Tan, Mahula, Crompvoets, 2021; Kshetri et al., 2021; Hughes et al., 2019; Schuetz & Venkatesh, 2020; Mittal et al., 2021
What is a smart contract?	Kumar E, Talasila, Pasumarthy, 2021; Hussien et al., 2021; Ostern, Holotiuk, Moormann, 2021; Gao et al., 2021; Nóbrega et al., 2021; Viriyasitavat, Hoonsopon, Bi, 2021; Yong et al., 2020; Rassenfosse & Higham, 2021; Behnke & Janssen, 2020; Wang, Tao, Wang, 2021; Helliar et al., 2020; Pan et al., 2020; Chen et al., 2020; Wong et al., 2020; Perdana et al., 2021; Centobelli et al., 2021; Liu & Li, 2020; Janssen et al., 2020; Powell et al., 2021; De', Pandey, Pal, 2020; Weigand et al.,2020; Kshetri et al., 2021; Bumblauskas et al., 2020
What are the characteristics of blockchain?	Kumar E, Talasila, Pasumarthy, 2021; Hussien et al., 2021; Ostern, Holotiuk, Moormann, 2021; Latif et al., 2021; Warkentin & Orgeron, 2020; Gao et al., 2021; Wang, Luo, Lee, 2019; Nóbrega et al., 2021; Karamchandani, Srivastava, Srivastava,2020; Viriyasitavat & Hoonsopon, 2019; Nanayakkara et al., 2021; Søgaard, 2021; Yong et al., 2020; Rassenfosse & Higham, 2021; Behnke & Janssen, 2020 Wang, Tao, Wang, 2021; Helliar et al., 2020; Pan et al. 2020; Benedict & Gill, 2021; Toufaily, Zalan, Dhaou, 2021; Di Vaio & Varriale, 2020; Wong et al., 2020; Kamble, Gunasekaran, Sharma, 2020; Upadhyay et al., 2020; Perdana et al., 2021; Frizzo-Barker et al., 2020; Salcedo & Gupta, 2021; Piñeiro-Chousa, López-Cabarcos, Ribeiro-Soriano, 2021; Kshetri et al., 2021; Hughes et al., 2019; Schuetz & Venkatesh, 2020
How does blockchain technology benefit businesses?	Kumar E, Talasila, Pasumarthy, 2021; Hussien et al., 2021; Mazumder, 2021; Wang et al., 2021; Janssen et al., 2020; Sinha et al., 2020; Ostern, Holotiuk, Moormann, 2021; Latif et al., 2021; Christen et al., 2021; Gao et al., 2021; Wang, Luo, Lee, 2019; Nóbrega et al., 2021; Nóbrega et al.,2021; Mishra, Shukla, Sharma, 2021; Dwivedi et al., 2021; Collins et al., 2021; Nanayakkara et al., 2021; Viriyasitavat, Hoonsopon, Bi, 2021; Yong et al., 2020; Rassenfosse & Higham, 2021; Behnke & Janssen, 2020; Stephanie &

Sharma, 2020; Wang, Tao, Wang, 2021; Helliar et al., 2020; Aysolmaz & Reijers, 2021; Pan et al., 2020; Benedict & Gill, 2021; Kar & Dwivedi, 2020; Tönnissen & Teuteberg, 2020; Nishant, Kennedy, Corbett, 2020; Toufaily, Zalan, Dhaou, 2020; Di Vaio & Varriale, 2020; Bumblauskas et al., 2020; Lytras et al., 2021; Schneckenberg et al., 2021; Mäntymäki, Baiyere, Islam, 2019; Ciriello, 2021; Wong et al., 2020; Kamble, Gunasekaran, Sharma, 2020; Queiroz, Samuel Fosso Wamba, 2019; Muthukannan et al., 2020; Upadhyay et al., 2020; GE et al., 2021; Perdana et al., 2021; Schlatt et al., 2021; Frizzo-Barker et al., 2020; Salcedo & Gupta, 2021;Piñeiro-Chousa, López-Cabarcos, Ribeiro-Soriano, 2021; Centobelli et al., 2021; Völter, Urbach, Padget, 2021; Liu & Li, 2020; Thompson & Venters, 2021; Janssen et al., 2020;Alles & Gray, 2020; Scholl & Bolívar, 2019; Jeyaraj & Zadeh, 2020; Powell et al., 2021; Dwivedi et al., 2020; He, Zhang, Li, 2021; Barnes et al., 2020; De', Pandey, Pal, 2020; Weigand et al.,2020; McCallig, Robb, Rohde, 2019; Vincent, Skjellum, Medury, 2020; Alles, 2020; Kocsis, 2019; Yen & Wang, 2021; Diller, Asen, Späth, 2020; Zarzuelo, Soeane, Bermúdez, 2020; Broo, Boman, Törngren, 2021; Tan, Mahula, Crompvoets, 2021; Papagiannidis & Marikyan, 2021; Pee & Pan, 2021; Kshetri et al., 2021; Hughes et al., 2019; Schuetz & Venkatesh, 2020; Deppu & Ravi 2021

Decentralized Ledger Technology

To understand how decentralized ledger technology works, we group the infrastructure into four categories: a) data access rights with permission, b) data access rights without permission, c) access in a private network, and d) access in a public network. On the Bitcoin and Ethereum platforms, the protocols are grouped as unlicensed public blockchains, which means that anyone can register because there are no restrictions on the right to trade. Each node verifies all transaction inputs and outputs available from each member of the blockchain network.

The most common consensus mechanism used in public blockchains is Proof-of-Work (PoW). It is a secure algorithm based on the basic idea of a scenario that puts participants in the solution of a challenging computer puzzle game and invites them to find the fragmentation of the block given to the set of transactions at a price lower than the standard. The member who can solve this puzzle after the block has been added to the network receives a certain amount of reward in bitcoin. The main drawback of the current PoW protocol is that it consumes a lot of energy and computing power.

The Hyperledger Fabric or Corda platforms allow private participation in a blockchain. Private blockchains use the Proof-of-Authority (PoA) mechanism to add a block to the chain. This mechanism invites nodes to vote on whether the block can be added, and if nodes reach a consensus on the block, it is permanently added to the blockchain. Otherwise, the block is rejected. Thus, in order to use PoA, each node must be disclosed and certified. There are many other algorithms used in platforms, such as the proof of stake mechanism (PoS) and practical Byzantine fault tolerance (PBFT) (Hussien et al., 2021; Nóbrega et al., 2021; Søgaard et al., 2021; Tan & Mahula & Crompvoets, 2021).

Twenty-four blockchain platforms have been introduced to the market by different organizations and developers (Nanayakkara et al., 2021). However, choosing the right platform is an incredibly complex task, as it depends on features related to technical issues and the characteristics of the company that wants to use it.

In general, DLT provides a level of transparency and trust. These features take advantage of new tools such as smart contracts that can be implemented on the main network, enabling decentralized applications in many sectors (Rassenfosse & Higham, 2021).

Smart Contract

In the chains of blocks, different types of token currencies represent either an asset or a utility, whose exchange value can be either a cryptocurrency or a utility brand, or even the name and origin of a bond or investment title, or anything else. The way blockchain users communicate and exchange information is based on the concept of distributed ledgers, which allow users to store valuable information in a database and extract value from it. This is why smart contracts are so important.

A smart contract is executed when a transaction takes place on the blockchain network. Nodes run applications, and smart contracts allow a blockchain node to carry out automated transactions without a trusted third party (Nóbrega et al., 2021). They are contracts that contain a predefined code of logic and mathematical functions and are irreversible (Latif et al., 2021).

Smart contracts, as a programmed infrastructure, are characterized as the most transformative applications based on blockchain systems (Kshetri, 2021; Liu & Li, 2020). In this infrastructure, all smart contract execution records are stored in blocks, allowing any interested party to access the transaction information.

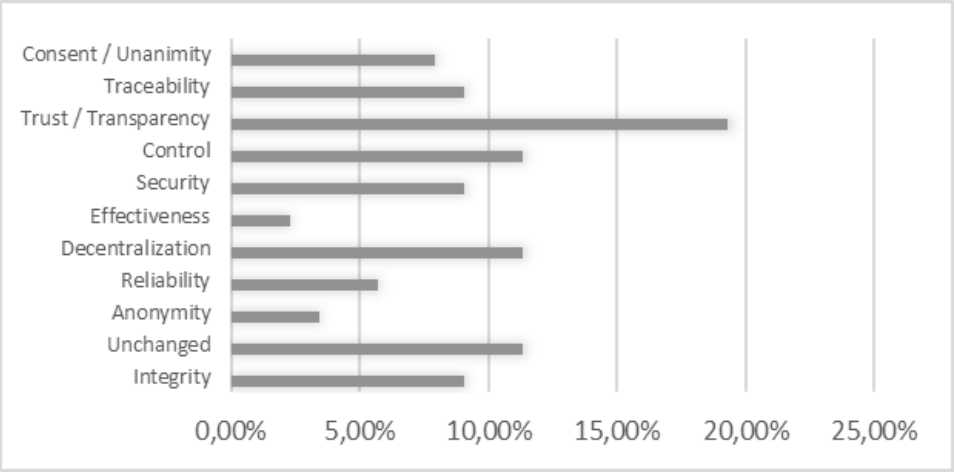
Ethereum is the first advanced blockchain platform used to create and process smart contracts (Kshetri, 2021). Through smart contracts, the technology has evolved to the point where it has surpassed the level of cryptocurrencies. It now stores different types of data related to economics, law, health, education, governance, circular economy, and real estate, and generally finds applications in commercial and industrial sectors (Centobelli et al., 2021).

The ability to integrate smart contracts into authorized blockchains leads to the proliferation of the technology (Helliar et al., 2020). Smart contracts are used automatically, securely, and trustworthily through blockchains, and take up more space than shared contracts. Blockchains shed light on transaction fraud as all data is continuously tracked and validated, increasing legal certainty (Wang, Tao, Wang, 2021).

Characteristics of Blockchain Technology

Blockchain technology includes a variety of characteristics that are distinguished or differentiated depending on the reason for its application, the way it is designed, and its architectural structure. However, in the present bibliographic review, most scholars focus conceptually on the characteristics of integrity, immutability, anonymity, reliability, decentralization, efficiency, security, controllability, transparency and reliability of its data, traceability, unanimity, and consensus.

FIGURE 1
THE QUANTIFICATION OF THE REPORTS THAT HIGHLIGHT THE CHARACTERISTICS OF THE BLOCKCHAIN TECHNOLOGY



The analysis of the conceptual representation of blockchain characteristics showed that decentralization, control, immutability of data and trust and transparency predominate over other characteristics, as shown in Figure 1. These results are the technology's main characteristics.

The results of these studies highlight the four key features of the technology.

Decentralization

Decentralization is the cornerstone of blockchain technology (Kumar & Talasila & Pasumarthy, 2021). This is because a combination of decentralized technology architecture, cryptography, and incentives enables resource transfers between unknown participants in a scalable manner (Benedict & Gill, 2021). Decentralization enhances the persistent and secure storage of all configurable data without the need for a central authority to control transactions (Hussien et al., 2021). Another aspect of the decentralization feature is that, combined with the real-time updating of information, it makes the technology useful in networks involving different organizations (Pan et al., 2020). The degree of decentralization resulting from the operation of a blockchain application in a peer-to-peer network depends on the choice of nodes, which are under the control of the owner. Private blockchains operate in a trusted environment and have the highest level of decentralization. However, all types of blockchains share, to varying degrees, the benefits of decentralization. These benefits reduce the likelihood of failures and increase data integrity (Viriyasitavat & Hoonsopon, 2019), allowing transactions to be executed in a secure manner with the lowest cost and time by avoiding intermediary third parties. The benefits of different types of blockchains are technically different in terms of decentralization features (Tan & Mahula & Crompvoets, 2021). Decentralization, as the main benefit of blockchain technology (Vaio & Varriale, 2020), creates new business models, opportunities, experimentation, and investment return expectations (Toufaily & Zalan & Dhaou, 2021).

Unchanged Data

The requested database, maintained in different nodes instead of a central location, is constructed by a potentially immutable audit trail and smart contracts that automatically enforce and verify the terms of the agreement between users of the blockchain application (Ostern & Holotiuk & Moormann, 2021). Calculations and data sharing are based on an immutable encrypted protocol that is verified, replicated, and used in a decentralized environment. An irreversible algorithmic function is used that allows the representation of text or a numeric string of variable length in a single string of predefined length (Centobelli et al., 2021). It is an immutable storage of transactions on a blockchain using automation and governance protocols (Nóbrega et al., 2021; Wong, et al., 2020).

Data in blockchain applications is immutable because once a block of data is inserted, it cannot be altered or deleted, even if some nodes are faulty or malicious. This immutable resilience means that blockchain applications are controllable (Karamchandani, et al., 2020; Viriyasitavat & Hoonsopon, 2019). The fact that it is impossible to violate transactions increases the volume of applications. In some cases, user access issues arise to protect sensitive information or even to protect user anonymity (Behnke & Janssen, 2020). However, as an immutable ledger, blockchain applications provide a single version of the truth that increases trust in the information stored (Schuetz & Venkatesh, 2020).

Control Capability

The reliability of data stored using blockchain technology reduces the need for auditing processes in companies (Karamchandani et al., 2020). The design and structure of the system, based on cryptographic hashing, improves its auditability (Völter & Urbach & Padget, 2021). The level of control of a blockchain system depends on its type and implementation. Private blockchains have less control because a single entity manages the nodes, while public blockchains have more control because the nodes are truly decentralized (Viriyasitavat & Hoonsopon, 2019).

The evolution of blockchain technology now allows users to digitally record events and incorporate additional features such as smart contracts to prevent and address technological disruptions such as fraud (Vaio & Varriale, 2020). Due to the accuracy of data recording and full visibility, audibility is highly effective (Kamble et al., 2020). In many cases, verifying the identity of information and transactions has

the potential to eliminate time-consuming and costly intermediaries (Ostern & Holotiuk & Moormann, 2021; Wang, Tao, Wang, 2021).

Eliminating third parties for data control can lead to the elimination of centralized platforms, opening new horizons for innovative business models and the integration of novel controls into traditional systems (Wong et al., 2020; Toufaily & Zalan & Dhaou, 2021; Weigand et al., 2020).

Trust and Transparency

According to researchers Ostern & Holotiuk & Moormann (2021), the feature of the blockchain that is of particular interest to institutions and researchers is its ability to provide a 'single truth' between users without requiring them to know or trust each other. Trust is enabled by the unique combination of the key technical elements of blockchain and begins to shift from humans to algorithms.

Various human management functions are automated by code, creating new trust architectures (Frizzo-Barker et al., 2020; Piñeiro-Chousa, López-Cabarcos, Ribeiro-Soriano, 2021). Blockchain is, therefore, a 'trustless' solution, where the technical part ensures that transactions are not altered, while the transparency and immutability of transactions mean that the blockchain is auditable (Wang et al., 2019).

Trust and transparency in business processes can change the business mindset by adding value as a result of blockchain adoption (Toufaily & Zalan & Dhaou, 2021; Karamchandani, et al., 2020; Viriyasitavat & Hoonsopon, 2019). In general, data trust in blockchain systems can be improved, as we have only seen the beginning of the potential of such systems (Powell et al., 2021).

THE BENEFITS OF BLOCKCHAIN SERVICES FOR BUSINESSES

As the digital era is undergoing a period of transition in terms of consumers and personalization, the use of technology is becoming increasingly important for economic organizations and businesses. Blockchain technology faces challenges in various areas, such as platform maturity (Toufaily & Zalan & Dhaou, 2021), digital payments, supply chain management (Hughes et al., 2019), money finance, and the public sector in general (Upadhyay et al., 2020). The technology has already expanded into healthcare, governance (Nóbrega et al., 2021), energy, the music industry, employment management, land management, and many other innovative applications (Wang et al., 2019). The application of blockchain with other cutting-edge technologies, such as the Internet of Things, big data analytics, hyperphysical systems (Queiroz & Wamba, 2019), robotic automation, artificial intelligence, and machine learning, is leading organizations toward remote automated processes (Mazumder & Garg, 2021), both for future business value and to meet the high expectations of market participants (Ostern & Holotiuk & Moormann, 2021).

Blockchain transparency creates trust and benefits in business supply chains while ensuring agile business outcomes (Nozari et al., 2023). The distributed ledgers of blockchain technology provide businesses and organizations with improved efficiency, security, and access to business data. The threat of inflation, working from home, and general instability in the global economy are increasing the willingness of businesses to adopt blockchain solutions due to the technology's powerful features (Ashurst & Tempesta, 2021). However, stakeholders may have competed views and interests due to the regulations that govern blockchain operations (Bolívar et al., 2021). In addition, companies providing blockchain-based information may benefit if all members of the supply chain optimize costs for the blockchain by extracting valuable information (Liu et al., 2020). Blockchain with decentralized finance leverages new alternative financial systems that create innovative business models. With blockchain processes, it is possible to enrich and improve financial operations and asset management systems. These benefits encourage companies to come up with innovative solutions (Hazir, 2021).

The literature review highlighted the benefits of blockchain technology. In general, there is a certain level of acceptance of blockchain by different sectors. However, a prerequisite for blockchain adoption is the existence of a strong IT-related infrastructure among stakeholders to ensure value creation.

The research conducted identified the key characteristics of blockchain technology. The property of transparency as a key characteristic of blockchain sets the stage for changes that business models will need

to address. The ability to create future decentralized applications raises actions to meet the needs of modern society.

Businesses can take advantage of the technology and reap the benefits of decentralized and immutable data storage, with security that enhances transparency between transacting parties. Smart contracts, with the provision of secure information to stakeholders and the elimination of intermediaries to control data, create innovative business models.

The moderate role of the state in certification issues (Jung et al., 2020) leads us to look for other enactment solutions. Issues related to trust can be solved with the smart contracts of blockchain technology (Ajwani-Ramchandani et al., 2021), which provide transparency at all levels of the company. Blockchain is a common innovative means to ensure data exchange and authenticity of transactions between stakeholders (Wang et al., 2019). These features enhance the use of different accounting systems to access additional information, which can help provide greater insight and analysis of the data already used. Blockchain technology can be used as a supply chain decision model to help manage the traceability of products (Gölcük, 2022), as it does not appear to impose additional costs on retailers (Ji et al., 2022) and generates profits for manufacturers when the cost of producing the product is high (Jiang & Chen, 2021). Such applications are more readily adopted in the supply chain when organizations face regulatory pressure (Hartley et al., 2022). As consumers recognize the value of the blockchain demonstration, knowledge about provenance is created (Montecchi et al., 2019). Applications with blockchain technology enhance market choice and product evaluation (Yang et al., 2021), (Gao & Wang, 2018).

These characteristics strengthen the choice to use blockchain services, which can be a starting point for ensuring compliance with local regulations and corporate social responsibility (Ajwani-Ramchandani et al., 2021).

It is interesting to focus on the view that such a technological model can bridge the values and ethics between the social economy and technological innovation. These conditions are attracting the interest of the scientific community.

DISCUSSION AND CONCLUSIONS

The specifics of blockchain technology, such as the lack of privacy, the high cost of integration and adoption, the use of the technology in security models to enhance data integrity, the limited flexibility, and the lack of governance (Hughes et al., 2019), are issues that need to be discussed. One of the inhibiting factors for blockchain applications and solutions is the lack of skilled human resources to work effectively with the technology. We have identified studies that report on new approaches to identifying the skills and qualifications required for emerging technology-related jobs (Chunmian et al., 2021; Koch et al., 2021; Tandon et al., 2021; Mittal et al., 2021), but this issue requires further research.

Confidentiality versus transparency is one of the key factors in adopting a licensed blockchain. Transparency is a predictor of leadership behavior, suggesting a relationship between blockchain technology and the personalities that can adopt it (Diller, Asen, Späth, 2020). As the level of transparency increases with blockchain technology, so does the role of professional bodies and stakeholders (Kshetri, 2021; Rassenfosse & Higham, 2021; Wong et al., 2020). We highlight the need for further research on the role of blockchain technology in bridging transparency with new knowledge flows to address the opacity of value networks.

In this study, a review of blockchain was first conducted to understand how the technology works. The characteristics that make the technology attractive were identified and the most important ones were analyzed. Finally, the factors that positively and negatively influence the adoption of blockchain by companies were analyzed.

The literature review showed that a prerequisite for the adoption of blockchain is the existence of a strong IT-related infrastructure among stakeholders to ensure value creation.

Observing the evolution of the technology, we see the extent of blockchain adoption by different sectors. In this study of recent research articles, it was found that researchers perceive and implement blockchain technology as a type of distributed ledger on a network of multiple computers. The extensive

literature review presented in the previous sections showed that blockchain applications are based on algorithms and combined with smart contracts, enable the creation of future decentralized applications in different sectors. The future value of using blockchain technologies is documented in terms of return on investment, business process improvements, changing business culture, efficiency, and new business models.

In addition, the study of the benefits of blockchain technology highlighted it as a tool for fair negotiation approaches between many different parties.

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