Blockchain as an Instrument for Improving Banking Processes

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ARTICLE INFO

Review Paper

Article History:
Received November 2022
Revised February 2023
Accepted February 2023

JEL Classification:
A10, G21, O31

Keywords:
Blockchain
Financial sector
Banking sector
Business model
Innovation

UDK: 336.74:001.895
DOI: 10.2478/ngoe-2023-0005

Cite this article as: Vukovljak, B. (2023). Blockchain as an Instrument for Improving Banking Processes. *Naše Gospodarstvo/Our Economy, 69*(1), 43-55. DOI: 10.2478/ngoe-2023-0005.

Abstract

One of the best-known innovations of the recent past is blockchain. Due to its usability, it has generated considerable interest in several economic areas. A decentralised system's approach can potentially reshape existing industries or make them redundant. Such technology can add a new dimension to processes, which is particularly relevant for the banking sector in the future. This demonstrates a great necessity to deal with blockchain with respect to market position and competition. This paper aims to provide insight into the current potential of blockchain applications in banking procedures. The benefits of process improvement in the financial sector are also outlined. This research shows that many experiences and adequate knowledge are already available. According to recent research, this technology will benefit banks' business models, performance, and capabilities. However, blockchain is still in the phase of research and development, which is a crucial aspect of the banking industry.

Introduction

„Banking is necessary, banks are not!". The statement made by Microsoft founder Bill Gates has been proven more than ever through contemporary innovations (Ficht & Alich, 2018). This is primarily because of the technological advances present nowadays, such as blockchain technology. It is one of the most recent developments, which has the potential to disrupt various economic industries and their business methods. A large number of economic stakeholders are interested in this development. Especially because of its wide applicability and potential (Deloitte Blockchain Publications, n.d.). The greatest attention is placed on the possibility of being able to use resources more efficiently and, thereby, gaining market advantages (Osmani et al., 2020, p. 892). The benefits are transparency, cost reduction and increasing efficiency in the transaction environment. In order to gain these benefits, numerous industries and governments worldwide have started to deal with blockchain (Osmani et al., 2020, p. 885-886).The same applies to the European Union, which proclaimed its political and legislative support for blockchain technology in

the European Blockchain Strategy brochure. Blockchain is regarded as one of the EU's most significant technologies (European Commission, 2021). Another component of this awareness is the capacity of blockchain to influence the transformation of entire economic organizations. This innovation is anticipated to have a greater influence on economic competitors who typically perform the function of middleman in business circumstances (Tapscott & Tapscott, 2017).

Why are many predicting a blockchain-based banking revolution? The banking business is accustomed to changes. Even in the past, technology and its progress have been a crucial part of banking development (Martino, 2021, p. 1), due to the fact that innovation brings about modifications, challenges, and, moreover, new opportunities. This engagement was driven not just by the will of the banks, but also by the constant changes in the corporate environment, society, and market competitiveness. Further developments, particularly with the arrival of the internet, have become a necessity and trigger the expectation of tomorrow's customers to follow suit (KPMG, 2018, p. 10,16,20). Despite the fact that banks continue to play the role of middlemen in the modern financial system, blockchain has attracted growing attention. It must be pointed out that the banking area is one of the industries that can be seriously affected by blockchain technology. Furthermore, banks are being compelled to examine their future strategic direction in light of this technological evolution (Tapscott, & Tapscott, 2016, p. 37). The rationale is that blockchain offers decentralised operations, which is the exact opposite of traditional banking institutions. Therefore, the current demand to save various resources, as well as political and regulatory constraints, may be met more effectively - beginning with the company's services and concluding with its business model. Consulting firms like Deloitte, which are heavily invested in blockchain issues, indicate that the current structure of banks will undergo a radical transformation. It is considered that a revolution in the financial sector could occur (Deloitte., n.d.-c) - especially now, that blockchain has produced new financial industry participants. These include financial start-ups and Internet giants such as Google, Amazon, Facebook, and other major corporations seeking to extend their business ecosystems using blockchain technology (Jaksic & Marinc, 2019, p. 8-9). Some experts believe that current start-ups are establishing themselves and becoming a vital part of the financial scene. Many of these businesses are optimistic that they will be able to meet this goal. In comparison to a typical bank, their strength is that they are perceived as modern and inventive. As a result, various stakeholders must be made aware of the impending danger (Hawser, 2017). It is obvious that this leads to additional pressure and should encourage reconsideration. However, it is a strength of traditional banks since they already have a solid foundation on which to respond to these difficulties and contribute to the progress (Deloitte., n.d.-c). Therefore, it is essential not to disregard this development, but to embrace the change. Don and Alex Tapscott (2017) put it simply in their article “If you don’t, someone else will.”

This paper illustrates the potential power of blockchain technology based on the literature now accessible in the blockchain area. Particular emphasis is placed on the influence and effect of this evolution on the financial system. A demonstration of insight and its benefits is provided, as well as a synthesis of diverse fields of knowledge. It should help underline the significance of addressing this technology, notably in the financial industry, and raise the issue's visibility. This is done to highlight the utility of this innovation and the competitive advantage enjoyed by some economic entities. Consequently, this work is founded on the hypotheses that blockchain technology is applicable in a variety of banking areas and will change processes, as well as procedures. Accordingly, this work aims to advise stakeholders to address this technological development in a timely manner. The remaining chapters cover the following subjects: The first chapter presents a more detailed overview of blockchain technology and explores its applicability to the banking area. A non-technical explanation, supported by examples, provides a greater understanding of the technology. Furthermore, the meaning of the term revolution in the context of banks and blockchain is illustrated. The second and third chapter constitute the main body of this article. They examine the application of blockchain, as well as its impact on banking procedures. The benefits of implementing blockchain are outlined with a focus on pertinent banking applications. It provides an outline of the substantial advantages of blockchain adoption in the banking sector at present. Additionally, the focus is placed on the financial processes where this new development is useful and leads to a transformation. The remaining chapters contain the results and further research topics, a discussion and a final conclusion. The discussion interprets the findings gained in the literature review and provides a critical view of the current state of the antiquated financial system and its challenges regarding blockchain development. Once again it emphasizes the importance of blockchain technology in the banking sector and the need to consider it in future investment decisions.

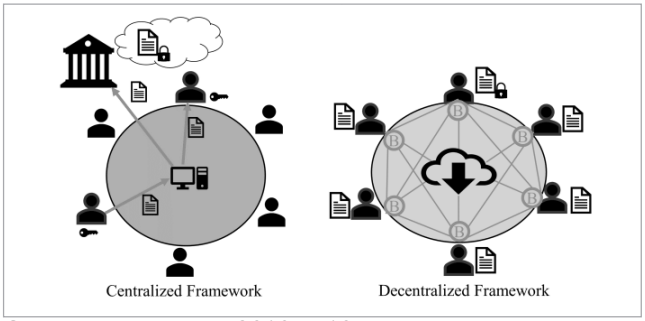
Theoretical Background

Key characteristics of the blockchain system and its relation to the banking sector

Blockchain, a new technological advancement, has received a lot of attention. The cause for this was the recent intensive media coverage of crypto currencies (Sladic et al., 2021, p. 1). This technology encourages decentralisation since it was created to facilitate the transmission of digital currency, like Bitcoin, with the intention that these transactions takes place without a middleman (Martino, 2021, p. 9-10). The emphasis is placed on the database and transaction area, which is best explained by the idea of a digital book, where everything is recorded and not erasable (Kosanovic & Bozovic, 2021, p. 144). However, it became evident that blockchain has much more scope than simply being the technology underlying the crypto realm. The database, which is distributed rather than centralised, is a key element. Each contributor possesses a copy of the database, which is why it is referred to as "distributed". (Deloitte., 2016-b, p. 3-4). Moreover, this occurs in real time, with equal access and insight for all participants. This innovation allows users to record and share a common view of a system´s state across a distributed network, which additionally aims to provide integrity and trust in such environments. It means nothing else than that equal members interact directly with one another, without having any central coordination, knowing that all database entries are preserved and cannot be changed. Therefore, this is commonly known as a peer-to-peer network (Wie funktioniert eine Blockchain?, n.d.).

Figure 1

Centralised and decentralised framework

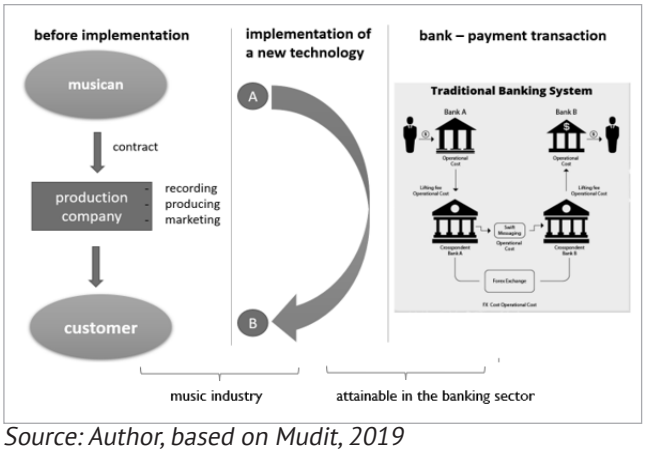


Source: Puthal et al. , 2018, p. 18

Figure 1 depicts and contrasts the interaction between the stakeholders in such a system, as well as the concepts of centralised and decentralised approaches. The right side of the illustration shows a typical decentralised setup of a blockchain. Participants marked with a B represent the members of this decentralised environment. Without a central authority, all parties have the same insight and access. There is no central authority responsible for control. Furthermore, the lines within this circle represent the connection between the members and indicate the possibility of data transmission. The left side of figure 1 is the opposite. A typical centralised system found in many service industries that retain the role of an intermediary. Control and networking are exclusive to the central unit. All other participants in this area are not connected to one another and, therefore, cannot share information, which is also a common system in the financial industry, particularly in the traditional banking sector (Drescher, 2017, p. 21). Within this network, transmissions are aggregated to form a block. In order to prevent fraudulent actions, these transactions are always subjected to verification so that their legitimacy may be confirmed. If the verifiers, called miners, find a match the block is added to an existing chain. This block-to-chain approach is also derived from the term blockchain. Further, Deloitte utilizes the analogy of a string of pearls to make the complex process more understandable for non-technical audiences. Each bead symbolizes a block, and within each block are the transactions. It is vital to note that a blockchain might be of infinite length, with different values in each block, which is typically not the case with a pearl necklace. This is, of course, one of the most significant differences, excluding the other technological elements (Deloitte., n.d.-d). This unique functionality and structure of this technology have the ability to force entire industries to change or even become obsolete (Drescher, 2017, p. 24).

Figure 2

Influence of a P2P-system: Music industry/banks



Source: Author, based on Mudit, 2019

According to Drescher (2017), a banking professional in electronic security trading, the music industry is an outstanding example, which shows the impacts of a peer-to-peer network, even though this industry has nothing to do with banking. Nonetheless, it demonstrates the potential impact of emerging technologies and should contribute to awareness. This is to highlight the challenges and opportunities that blockchain technology advancement presents. The purpose of Figure 2 is to portray the strategy followed by the music industry at the time and to emphasize

the transformation that ensued after the introduction of new technological solutions.

The left side of the graph depicts the usual approach in the music industry throughout those years. It was typical at that time that a production firm distributed the musician's music to the music buyer. The songs were produced and marketed by the production firm. This activity was regulated by a contract between the musicians and the producer. No direct relationship existed between the musician and the end user. With the advancement of digitalization and the creation of the Napster platform, musicians have gained the ability to operate more independently, starting from the production of music to the launch. Consequently, the peer-to-peer system spread rapidly, and the production company became quite redundant. This example shows the rapid obsolescence of enterprises whose primary function is to act as an intermediary for services. With this renewal, the musicians could connect directly with those who were interested in their music, which is illustrated in the graph's middle section.

The current strategy for foreign transactions is depicted on the right side of the graph. International payments are a good example in the banking business, which may be susceptible to such a change, especially considering the centralised nature of the current banking system (Drescher, 2017, p. 20-22). What the figure also demonstrates is that correspondent banks are frequently required for overseas payments, affecting cost, time, and other process variables (Schlatt et al., 2016, p. 26-27). Furthermore, banks are under increasing pressure to become more efficient and cost-saving. Several components of the existing payment system could be simplified and made less expensive through the use of blockchain technology. Costs could be reduced by avoiding intermediary correspondent banks. Various parties would benefit from the partial removal of expenses, losses, uncertain currency fluctuations, speed, and regulatory and security needs. This process alone is designed to be simplified with a decentralised procedure. The P2P system provides the precondition. Firstly, it must be recognized that financial institutions still employing a conventional strategy should recognize the need for change (Mehta et al., 2021, p. 186-187). Particularly considering that it is known that, new competitors have appeared in the banking industry. These are frequently better acquainted with technology such as blockchain and are attempting to strengthen their presence through innovative services and products. Secondly, as is well known, larger companies such as Microsoft and IBM are heavily engaged in the development and research of blockchain technology. The technology giant Microsoft argues that the scope of blockchain is unclear and should be addressed immediately due to its competitive advantages. It is comparable to the evolution of the Internet at the time. These arguments are supported by several projects that are currently ongoing (Ritz, 2018; IBM, n.d.-a). Furthermore, Internet heavyweights such as Facebook, Amazon, and Google, among others, are attempting to gain banking licenses in order to diversify their product portfolios. Attention is suggested because these firms also own IT companies and are actively involved in the investigation of new technologies (Jonietz et al., 2018, p. 373-374). One critical reality is that blockchain illuminates prospects for both banks and non-banks (Harris & Wonglimpiyarat, 2019, p. 627).

Finally, it is important to note, that despite the benefits of this technology, the same old hazards might emerge; risks which are now successfully kept under control by the current banking sector. It is not enough to be blinded by the potential of new technology. Therefore making it necessary to try to identify, handle risks and vulnerabilities in a timely manner, since economic growth requires a stable financial system (Buch, 2021), which was generated following previous crises, for example, through the implementation of regulatory measures in Europe. Claudia Buch, Vice President of the German Federal Bank, points out an essential fact in a publication: profitable financial institutions do not ensure financial system stability. Profitability can be linked to a high level of risk-taking. History has demonstrated that a solid financial system is frequently decisive. As a result, new business models should have a healthy balance between the promise of new innovations and the tolerance for risks (Buch, 2018). Furthermore, consumer protection, IT security, cyber threats, data protection, compliance issues and a variety of other concerns must be resolved (Fußwinkel & Kreiterling, 2018; Europäisches Parlament, 2023; Deloitte AG, 2019).

Potential benefits of using blockchain technology in the banking sector

The traditional banking sector is facing a particularly demanding market environment and challenges in the financial sector. Based on KPMG research on banking environment expectations, banks are increasingly confronted with changing political and economic circumstances. New players, shifting society expectations, and emerging technologies like blockchain are driving banks to reconsider their current business model. Flexibility, resource efficiency, cost structure, and adaptation will be among the primary concerns of traditional financial organizations. For example, as a result of new developments, new regulatory measures will increase and become more focused. Furthermore, new client generations are becoming increasingly interested in simple and customizable service offerings, which are

provided by new market entrants, such as fintechs (KPMG, 2018, p. 14-16). According to Tapscott (Tapscott, & Tapscott, 2016, p. 82-83), the financial industry is one of the last to experience a significant technological shift. Some stakeholders consider that certain processes are outdated and, thus, excessively time-consuming, as well as lacking a high level of security. This is because in the past, new technologies were frequently installed and processes were not modernized in the background. Allowing and implementing technologies like blockchain should allow a variety of parties to participate in the economy more efficiently (Tapscott, & Tapscott, 2016, p. 37). Further, blockchain provides a significant element that resolves the issue of trust in business procedures. This makes it possible to eliminate various middlemen from existing business practices. Many processes will not require the involvement of banks, notaries, or the government. Streamlining procedures while leveraging benefits would be possible. This then leads to using various advantages of this innovation for its needs and acting more competitively (Deloitte., n.d.-d). The simplification of present banking procedures would benefit both clients and financial organizations, with the goal of improving speed, lowering costs, increasing security, reducing errors, and eliminating error sources and key areas of attack (Tapscott, & Tapscott, 2016, p. 20). What is already evident, and can be found repeatedly in the literature, are the benefits that blockchain technology offers. This innovation carries with it a variety of advantages that can help banks remain competitive in the face of this difficult market (Osmani et al., 2020, p. 884-885).

Transparency is one of the most well-known advantages made possible by blockchain technology. This level of transparency was previously unattainable in the banking industry, but is currently made possible by this technological progress, which can facilitate a financial environment procedure (Jung, 2019). This transparency is made feasible by the fact that every transaction that occurs within the network is documented and can be monitored. Thus, a transaction history is accessible to all parties involved. Additionally, this system may keep any type of information and documentation (Ji & Tia, 2022, para. 3.4). Knowing the date and time of each transaction increases the level of transparency, hence, reducing the likelihood of fraud. Further, this option is intended to improve and make it more accessible for customers regarding data insights. There is already a need for transparency in the securities business, as investors require access to essential and accurate investing data. Access to information leads to prudent investment choices (FMA, n.d.-b). Transparency can facilitate decision-making for individual investors and institutions equally (Tapscott, & Tapscott, 2016, p. 51). It can also be advantageous for regulatory requirements. A simplified accountability is provided for tracking the actions of financial organizations, which, of course, could aid in preventing future financial crises like 2008, when the authorities' knowledge was a big factor (Tapscott, & Tapscott, 2016, p. 82-83). Banking and regulatory communication would be streamlined. Responsiveness regarding process difficulties and possible violations would be increased through real-time functionality (Kawasmi et al., 2020, p. 119-120). It has to be highlighted that transparency, and, thus, stability, is one of the European Banking Union's objectives for the banking industry in the EU (FMA, n.d.-a).

The cost aspect of blockchain's advantages is a further area of emphasis. Due to how blockchain works, it can have a positive impact on a business cost structure. The elimination of intermediaries alone would cut financial institutions' expenses. As a result, a significant number of bank processes can be streamlined and made more effective (Martino, 2021, p. 45). Estimates from numerous institutes consistently indicate amounts of billions of dollars that can be saved by this conversion (Martino, 2021, p. 63; Osmani et al., 2020, p. 890). Any adoption to this technology can positively lower corporate costs by, for example, focusing on minimizing manual processes, favouring automation, and, in particular, adopting a peer-to-peer system. This, in turn, can entail updating IT solutions and infrastructure in some banking institutions, thereby increasing their competitiveness (Wilkie & Smith, 2021, p. 163-164). Another major part in the overall cost issue is the topic of sharing. The distributed approach regarding this innovation has a beneficial effect on overhead costs. On the one hand, costs are reduced due to the absence of middlemen, on the other hand, there are more users. Blockchain can provide people with access to the financial system that was previously unavailable. Finally, expanded and shared use of the blockchain network reduces server development, and operational expenses. Consequently, some anticipate that the prices of blockchain applications could be equivalent to those of internet usage today (Ji & Tia, 2022, para. 3.2;6).

The security of such a system is a recurrent issue of conversation surrounding emerging technologies. Due to its standards, a blockchain-based system is regarded as secure. The level of security offered by this development differs from that of the centralised system in use today, specifically, because this system is decentralised, distributed, consensus-based, and transactions are irreversible (Kawasmi et al., 2020, p. 122). This means, in greater detail, that all processes within such a network are not kept centrally. Each member of this chain has access to the transaction history map. Further, the encryption is conducted using a cryptographic method. This assigns a unique code to each transaction within this network, which must match the prior transaction. Selected

members of this system verify and certify the integrity of the entire operation (ÖAW Österreichische Akademie der Wissenschaft, 2017). Transparency is a crucial factor in this case and reduces the opportunities for manipulation, fraud, and cyber threats (Drescher, 2017, p. 194). Moreover, protection against single points of failure is also a crucial function of the blockchain network. The fact that all data is not held centrally, but instead is shared, protects the system from such an incident (Miles, 2017). According to a report by the German Federal Office of Information Security, the security maturity of blockchain technology offerings is higher, which is quite remarkable, given that this concept is still in its earliest stages of creation and investigation (Bundesamt für Sicherheit in der Informationstechnik, 2019, p. 47). Evidently, digitalization plays a significant part in contemporary business and personal life; hence, a higher level of security is anticipated (Schlatt et al., 2016, p. 27). It should be emphasized that there are currently a variety of blockchain versions (public and private), with varying levels of security (Miles, 2017).

Some of the various advantages of this development are the automation, efficiency, and time gains. As stated by KMPG, a number of financial organizations have already identified automation as an obvious benefit for the banking sector. Particularly in the case of repeating processes, the shift is regarded as highly useful. This can lead to improvements in quality, cost, employee accountability, and detection of error sources (KPMG, 2022). Companies would be forced to review and assess their operations as a consequence of the change to such technologies. It would lead to a revaluation of procedures, which might result in their becoming leaner and more efficient. These activities as a whole would enable the reduction of expenses, which can then motivate automation (Drescher, 2017, p. 243). Moreover, it might have an impact on the time component and lower some execution periods (Ji & Tia, 2022, para. 3.5). In this evolution, the prospect of digital contracts, also known as smart contracts, offers a contribution to efficiency and automation. These contracts can lessen the amount of work required by respective institutions, as their application coordinates the flow of transactions (JPMorgan Chase & Co logo, n.d.). Rapid technological advancement over the past few years has made this reconsideration essential. It has contributed to a rise in the volume of data that must be processed. This has changed the criteria and approaches to financial institutions. As just one response, there is an ever-increasing interest in blockchain technology, as it provides a great deal of what a business needs in terms of fluctuating requirements (KPMG, 2018, p.10,14-15). However, all of the modifications will have the potential to make the procedure easier and quicker, which will have a good economic impact on the companies (Kawasmi et al., 2020, p. 119,123). It must be reiterated that the elimination of middlemen plays a crucial role in this regard (McKinsey & Company, 2019, p. 3).

A note on the traceability element of this blockchain ecosystem should be made, as it is a key factor that influences and simplifies a number of other system properties. All of this is made possible by the blockchain's functionality, with transaction records in particular standing out. The blockchain exists to eliminate the need for a third party to process transactions between two business parties. Existing transparency and traceability should provide the required confidence in a business process (Wie funktioniert eine Blockchain?, n.d.). The database can be inspected and traced at any time, hence, absolute trust is theoretically unnecessary (Engelschall, 2019, p. 206). Another benefit of this function is that it simplifies and reduces the effort required to meet regulatory requirements. Through the new technology, it will be feasible, on the one hand, to simplify the current supervision measures and, on the other hand, to comply with the expanding rules (KPMG, 2018, p.15). Additionally, everything will be enabled in real time, which is not the case today (Martino, 2021, p. 50).

Using blockchain technology to improve banking processes

Blockchain is regarded as one of the most important innovations of the modern period (Kimani et al., 2020, p. 1). Particularly because its potential applications have sparked considerable debate among many parties (Martino, 2021, p. 39). A conviction exists that this technological progress will cause some adjustments in many sectors of the economy. According to research, the banking business, particularly its financial services, is poised to undergo significant transformation (Kimani et al., 2020, p. 2). This innovation has imposed new obligations on the financial industry and prompted numerous market participants in the banking area to reconsider innovation and adaptability. Current business structures, processes, and services are coming into focus and are to be reconsidered, which could be replaced by more innovative and fresh alternatives (Hacioglu, 2019 p. 22-23). Particularly, it is suggested that banks address this trend, as they stand to gain a substantial advantage or, in the worst-case scenario, face extinction. This is especially critical given the traditional banking industry's primary activity is intermediation (Schlatt et al., 2016, p. 25) and is already recognizable by the initial implementation of blockchain technology to process value transfers without the involvement of third parties, primarily through banks (Martino, 2021, p. 41). As seen by Deloitte, financial institutions must be innovators and actively support and participate in the future generation of

blockchain, since it will have an impact on a wide range of banking services and procedures, which include securities, finance offerings, international payment operations, and numerous other procedures (Deloitte., n.d.-d). However, it is known that the potential of this development has not yet been exhausted. Nevertheless, there are certain examples in the financial sector that have already initiated blockchain walkthroughs (Ritz, 2018). An illustration of this is the collaboration amongst several of the world's top banks to form the R3 Consortium project. This initiative aims to provide a common understanding of blockchain-based solutions in the financial sector (Tapscott, & Tapscott, 2016, p. 100). Moreover, the European Investment Bank has provided bonds on a blockchain platform. They believe digitalization will be equally advantageous for the emissions market (Europäische Investitionsbank, 2021). Since 2015, Wall Street has shown a keen interest in this technological development and wants to take advantage of the benefits (Tapscott, & Tapscott, 2016, p. 92, 99). Further, it must be stressed that numerous large financial institutions, including Goldman Sachs, RBC, Barclays, and many others, are displaying a great interest in blockchain technology (Tapscott, & Tapscott, 2016, p. 96). Another conclusion from a survey was that more than half of respondents stated blockchain technology is part of their company's long-term strategic plan. This demonstrates that the importance of this progress has been partially recognized (Deloitte Insights, 2020, p. 4).

Banks are still reliant on manual labour for the time being, which raises execution costs, creates fraudulent concerns, and maintains process transparency. Therefore, blockchain can aid in the reduction of numerous time-intensive processes, thereby significantly influencing profitability. Blockchain, based on literature, would bring identifiable value in the following use case scenarios:

- *Compliance and fraud*: Banks are required to secure consumer data and must follow certain regulatory guidelines. In a report by McKinsey, banks are spending billions on AML and fraud prevention, and the trend is increasing. Moreover, the costs associated with the required process modification or deployment are high. Besides, the upkeep of KYC processes is tough and becoming increasingly challenging. For proper operation, all of these procedures require rules, digitization, and timely information flows. The implementation of a blockchain system would be beneficial in these areas. The potential of a shared network, where multiple banks may access the data, would be quite valuable. This would save money, avoid fines, and eliminate fraudulent activities. Practical examples are already available. A realistic example is a blockchain-based KYC network test in the Asian banking market. This experiment yielded positive results and had a positive effect on efficiency (McKinsey & Company, 2019, p. 4-6).
- *Securities trading*: Blockchain is also gaining traction in the securities industry. The rationale for this is the possibility of improving settlement processes in the securities business. The current process has some risk and inefficiency. These transaction processes could be enhanced by eliminating middlemen and minimizing liquidity and counterparty risk (Schlatt et al., 2016, p. 27). A direct transaction mechanism would thus be available for securities trading. There would be no need for custodial or residential banks (Deloitte., n.d.-d). Wall Street is equally interested in adopting this technology to increase productivity and reduce risk (Tapscott, & Tapscott, 2016, p. 96). Furthermore, the financial product portfolio could be broadened. Offers via ordinary financial instruments would be possible. This offers the added benefit of increasing liquidity, lowering costs, and saving time (IBM, n.d.-b).
- *Payments*: The existing payment transaction process, particularly the international one, is resource-intensive and complicated (Kulkarni, 2017). This necessitates the participation of numerous parties, such as correspondent banks and clearing houses. In turn, this impacts the time, economy, and customer requirements, among other factors (Martino, 2021, p. 48-49). It is frequently related to the method of communication between the institutes, which is not always the best and can, therefore, delay the process (Faustino Bauer et al., 2019, p. 42). Frequently, fees are costly, and regulatory inspections can make the process even less efficient. Additionally, time zones regarding acceptance deadlines and monetary matters can be an issue. Since there is no obvious transparency in this process and a number of factors make it tiresome, it is no longer adequate for today's business needs. The direct method of transmission in a blockchain system can enhance and simplify executions. This technology unites the parties engaged in a transfer and provides them with opportunities that were not available before. In theory, this is a must in today's economic environment, and upgrading is desired. This would be beneficial in terms of expenses, security, runtimes, and traceability. Furthermore, payment transactions can be completed and tracked in real time. Another crucial element will be participation in the payment system, which is now open to non-banks as well as banks (Monetary Authority of Singapore, 2022). The reduction in fraud cases and payment losses with diverse origins is a further positive side effect. There are already market pioneers, such as Santander, Visa, and J.P. Morgan, who have established

and tested such a transaction system (Martino, 2021, p. 48-49; Mason, 2022).

- *Accounting*: The accounting of a bank necessitates clear consensus and data accuracy. Additionally, the regulatory requirements are lengthy and challenging. To assure the accuracy of the outcomes, these tasks require a significant amount of resources (Deloitte., 2016-a, p. 2-3). The purpose of explicitly is to avoid past occurrences that resulted in large losses and hence had an impact on the capital market. Lehman Brothers was one of the most well-known examples of this. Today's most pressing difficulties for modern accounting are: mistakes caused by human carelessness, intentional adulteration of the content, fraud cases and compatibility with contemporary corporate operations (Tapscott, & Tapscott, 2016, p. 107-109). It was acknowledged that blockchain has the potential to succeed in this field and improve numerous processes. This technology's ability to provide real-time and permanent documentation is a significant advantage for supporting the process change (Deloitte.,2016-a, p. 3-4). This would be advantageous for a number of parties, as they would receive regular financial data and procedure updates (Tapscott, & Tapscott, 2016, p. 108-109). Moreover, the auditor's scope of tasks in the field of audits would shift, allowing time to focus on critical transactions (Deloitte.,2016-a, p. 3-4).
- *Product management*: This new innovation will obviously effect a bank's product management in terms of banking products and services. This is due, in part, to the widespread digitization of the financial sector and customers' altered expectations for banking services. It is anticipated that traditional financial institutions cannot accommodate this transformation with their current product portfolio. In the future, conventional institutions will need to think outside the box in order to compete with newer, more technologically savvy businesses. Importantly, there will be digitalized product offers and new sales channels creating new opportunities (KPMG, 2018, p. 20). The function of product design will include a greater emphasis on real interaction and comprehension of the customer. There is a demand for new kinds of products that are simultaneously more efficient and resource-light (FMA, 2019, p. 19). Some traditional organizations' positioning strategies will be quite crucial and essential, since not only financial firms compete with their products, but huge technology groups are also important here (FMA, 2019, p. 9-11). These companies have the advantage of not being subject to the conventional regulatory bank requirements; hence, their product implementation is considerably more flexible. In certain areas, they were bolstered by low entry barriers, such as in the domain of payment transactions. Moreover, the impact will be felt across several product categories, including payments, loans, cards, wealth management, and niche products (FMA, 2019, p. 15-16).
- *Global trade finance*: New prospects in global trade finance are also being examined and pursued with regard to the usage of technology such as blockchain (Sangha, 2021). The difficulties of monitoring and supervising such trading operations have gained prominence, particularly in the aftermath of Covid-19 and other trading market disputes. Increasingly tight controls and audits, as well as regulatory obligations, make this process exceedingly expensive and challenging (Ernst & Young, n.d.). Some banks have already started collaborating with tech giants to streamline the trade finance procedure (Sangha, 2021). This generates new prospects for financial institutions and global trading partners. It intends to replace the old system by decreasing expenses, reducing bureaucracy, saving time, and streamlining regulatory requirements. All of this is possible because a blockchain platform for world trade eliminates intermediaries, fosters trust, and makes data accessible in real time. Specifically, the digital protocol, the smart contract, is beneficial, because this clearly regulates and automates the operations of trading partners and banks (Deloitte., n.d.-b).

Methodology

The purpose of this article is to provide a high-level review of the current state of knowledge on blockchain and the advantages for banking processes. It is a literature review that employs both comparative and descriptive research approaches. The results serve as a foundation for future blockchain research efforts in the banking sector. The first stage was to analyse, to the best of authors' knowledge, the most relevant literature on blockchain technology, specifically in the financial sector. Care has been taken to use literature from a range of sources so that the overview is not technical in nature, but rather pertains to the economic component. Since it is a fairly new and poorly explored technology, it made sense to gather several perspectives. Thus, publications by scientific experts, renowned auditing firms, large technology firms, government institutions, and financial institutions were consulted. The majority of the literature was from Europe and the United States, published in the English and German.

Following a wide literature search on blockchain to generate clear examples for a better understanding of this technology, the focus was on defined characteristics of this area. This was accomplished by establishing a hierarchy

among the themes, in order to summarize the investigation of this area more effectively. In order to better evaluate and contrast the current sources, it was organized into primary and subcategories. Afterwards, the emphasis was on the main features of this technology, with terms such as costs, security, traceability, efficiency, and transparency were formed. The same was done with regard to banking processes. Those who are currently often discussed in the literature have been selected. Payment transactions, securities, product management, accounting, global trade finance, compliance and fraud are just a few of the main topics. The objective was to raise awareness and draw attention to this issue within the banking industry.

Results

Through the literature analysis and its conclusions, it was possible to develop an overview of the topic of blockchain in terms of its potential advantages in the banking industry. Due to the complexity and diversity of blockchain, the analysis has been able to paint a relatively clear picture of the banking industry.

The consensus among professionals and institutions about blockchain technology and its disruptive character constitutes the first outcome. The banking industry was identified as the sector where the impact, whether positive or negative, is anticipated. Specifically, it was mentioned that the traditional banking sector may be harmed by this development. Since blockchain was created for the transfer of value, the current system, in which financial institutions play a key part in these transactions, may undergo change. Moreover, it was highlighted that emerging market competitors, such as fintech or technology firms, can generate this influence. Through the study of several papers, this has been repeatedly observed in the research with great clarity.

Another insight was the characteristics of this innovation, which were highlighted clearly in the main part of this paper. It was repeatedly suggested how banks might leverage this to their significant advantage, with regard to the cost element or improved traceability, as well as other characteristics listed in this paper, that can have an economic influence on the organization's environment. Furthermore, the many documentations demonstrate how all the things can be applied to banking procedures and their customer, collaboration partner, or regulator needs. Nonetheless, the benefits of blockchain are frequently described in a relatively superficial manner.

Overall, the investigation has shown blockchain's potential as well as the anticipated banking industry developments and that blockchain can provide intelligent solutions for processes and business models that are resource-intensive. The implication is that this technological advancement poses a threat to banks that do not engage with it and, hence, may miss out on adaptability. Due to the fact that this technology still has growth opportunities, it is prudent to participate in research and other projects. However, these promising results need to be investigated further for a more in-depth understanding of blockchain technology and its evident application prospects in the banking industry. It would be useful to look more closely at the various projects in this field and the present status of research. Additionally, it would be beneficial to focus more directly on specific banking areas and to design ways of implementing blockchain there.

Discussion

This research has examined the hypothesis that blockchain technology is applicable in a variety of banking areas and will change processes as well as procedures. Utilizing a literature review that comprised descriptive and comparative methodologies, a current overview and status of research on this topic were obtained. Blockchain is a novel technology that provides numerous benefits due to its decentralised nature and has the potential to change resource-intensive processes and procedures in the banking area. The traditional banking industry and its current central role in practices will be influenced, and new market participants, such as fintechs, will instigate change. Banks may leverage blockchain technology to their benefit in a variety of banking domains and develop, as well as implement, smart solution approaches. Since blockchain technology and its potential applications in the banking sector are still in its infancy, this hypothesis can only be substantiated on the basis of partial theoretical findings.

The contemporary banking market is attracted to technologies such as blockchain due to the ever-increasing demand for efficiency and developing economic challenges. This is supported by the "Banking 2030 Austria" research conducted by KPMG. Due to the changed environment, bank customers particularly expect a response and adaptation to new developments (KPMG, 2018, p. 4,16-17). All of this is supported and pushed by the advent of new business models that are particularly well-suited to the demands of a society that is always evolving and a political climate that is constantly shifting. Fintechs and internet behemoths

are progressively emerging as competitors in the financial environment and establishing new standards, which government agencies such as the Austrian Financial Market Authority reflect in their analyses (FMA, 2019, p. 10).

Traditional banking procedures are no longer suitable for the current era and are losing their competitive advantage as a result of their sometimes still antiquated practices. According to the present literature, a rethinking of current business procedures and business models is required because this transformation constitutes a danger to the banking industry (Martino, 2021, p. 4). This is already aided by the current understanding that blockchain may significantly contribute to resource savings through its implementation. Whether it is blockchain features like transparency, security, or traceability, cost is the key factor and has significance in today's world of global competition. The fact that the savings expected by this technical advancement are in the billions corresponds with beliefs about the importance of the cost element (Osmani et al., 2020, p. 890; Tapscott, & Tapscott, 2016, p. 221).

The banking Industry is undergoing a significant shift. Uncertainty remains regarding the precise nature and scope of blockchain's impact on the future of banking. The benefits of blockchain knowledge and the expanding presence of new revolutionary market participants are obviously expected to have an impact on banking. Deloitte underlines that this transformation will occur in particular economic sectors with an intermediary function and a centralised business approach (Deloitte., n.d.-d). A 2020 survey by Deloitte, based on the perspectives of executives from a variety of economic sectors and countries, provides additional evidence for these conclusions, including a representation of attitude regarding blockchain-related considerations. (Deloitte Insights, 2020, p. 4-6). In addition, the innovation initiatives of various financial institutions highlight the potential effect and interest in the banking process environment (Osmani et al., 2020, p. 886; Tapscott, & Tapscott, 2016, p. 372).

This literature analysis is limited by its emphasis on blockchain and its possible applications, as well as the resulting benefits for banking operations and procedures. Furthermore, a strong emphasis was placed on the conventional banking system and banks´ position as intermediaries, calling their business model into question. It did not address the economic trade-offs and efficiency related to the energy consumption that blockchain partially requires for its operations. Moreover, the regulatory and legal challenges posed by this development, which are crucial for process adaption via blockchain, are not addressed. All of these topics give further prospects for exploration, particularly if they can be linked to recognized blockchain benefits. However, a key conclusion from this investigation is the wide-spread application in certain financial systems, such as a model for conversion and implementation. This is a precise procedure that considers all significant aspects of process adjustment, as well as the relationship with other stakeholders, which is a topic that can cover a relevant gap in the literature and hence contribute significantly to ongoing bank development regarding the blockchain issue. The European Commission states that steps are being taken to construct a legal framework for the use of blockchain technology, but no clear direction has yet been established (European Commission, 2022).

Conclusion

Blockchain is a technology with an infinite amount of potential regarding the financial sector. As a result, banks can benefit from existing understanding of this technology and its characteristics in the present economic and commercial environment (Deloitte., n.d.-c). Furthermore, traditional banking organizations in particular can profit from upgrading and modernizing their somewhat outdated processes (Tapscott, & Tapscott, 2016, p. 37). As the financial market shifts to include new competitors such as fintech startups, internet behemoths and established technology corporations, it is crucial to adapt to the current circumstances. Their services and products are more inventive and enticing than those offered by some conventional financial institutions. They achieve an elevated level of customer satisfaction. Payment transactions serve as an excellent illustration. As blockchain technology greatly simplifies and improves the economic efficiency of this process. Eliminating the customary intermediary points in the remittance process reduces costs and intermediate steps that would otherwise be required (Jaksic & Marinc, 2019, p. 8-10). This underlines that banks' existing function as intermediaries in the service sector renders them redundant in many cases (Martino, 2021, p. 36). In addition, the absence of regulatory requirements creates extra obstacles and uncertainty (FMA, 2019, p. 15).

The availability of literature for the banking sector is given, as well as indications in which areas blockchain is well applied. Even though these findings are partial, they can be utilized as a starting point. Nevertheless, an engagement with this innovation is beneficial, in order to be able to make future strategic decisions for business, especially since it is well-known that numerous international projects have been initiated in various sectors. As history has often demonstrated, technological developments should be treated seriously.

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Veriženje blokov kot instrument za izboljšanje bančnih procesov

Izvleček

Ena od najbolj znanih inovacij v zadnjem času je veriženje blokov. Zaradi svoje uporabnosti je sprožila veliko zanimanja na več gospodarskih področjih. V okviru pristopa decentraliziranega sistema ima potencial, da preoblikuje obstoječe panoge ali jih naredi nepotrebne. Takšna tehnologija lahko procesom doda novo razsežnost, kar je v prihodnosti še posebej pomembno za bančni sektor. To kaže na veliko potrebo po obravnavi veriženja blokov z vidika tržnega položaja in konkurence. Namen tega prispevka je zagotoviti vpogled v trenutno strokovno znanje o aplikacijah veriženja blokov v bančnih postopkih. Razen tega so opisane prednosti izboljšanja procesov v finančnem sektorju. Naša raziskava je pokazala, da je na voljo že veliko število izkušenj in ustreznega znanja. Glede na najnovejše raziskave bo ta tehnologija koristno vplivala na poslovne modele bank, njihovo uspešnost in zmogljivosti. Vendar je veriženje blokov še vedno v fazi raziskav in razvoja, kar je ključni vidik za bančništvo.

Ključne besede: veriženje blokov, finančni sektor, bančni sektor, poslovni model, inovacije