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Classification of blockchain technology implementations in finance industry

Introduction

Blockchain technology, or distributed ledger technology, has the potential to resolve many problems in global markets. Blockchain is an evolving technology and understanding its scope and limitations will be critical to employing it to the business issues. The technology can be seen as an online, huge database for the exchange of information that takes place on a digital network to form a secure, transparent, and easy-to-use platform. It can be used to send money between countries, verify ownership rights, share electricity across grids or reduce the banking costs of verifying customers and transactions. Since 2008 when the assumptions for blockchain technology have been presented in the article "*Bitcoin: A Peer-to-Peer Electronic Cash System*" signed by Satoshi Nakamoto, many solutions have been developed and lots of them support nowadays businesses. However, not all of them create real added value so the most important thing is to outline the definition and methods required to describe what is the blockchain technology and what kind of advantages can it develop. Due to information gap within this area, it is needed to present a clear definition and model having the task to improve decision-making process in the worldwide companies. The main goal of this paper is to explain what is the blockchain technology, to present the method of blockchain solutions classification and their possible implementations in business.

1. Is blockchain more than technology?

Blockchain is an evolving technology and understanding its scope and limitations will be crucial for mangers, governments and everyone who would like to implement it within own business. Researchers say that blockchain technology has potential to redefine rules and models of today's business. On the opposite we

have to notice that the technology is still at an early stage of its development (although it has been 11 years since the white paper has been announced). Blockchain technology reminds the revolution or innovation involved many years ago. First attempts to use cryptography to resolve security and privacy issues were undertaken in 1981. Most tests made to transform the standard business processes did not get satisfactory results because each time the data leaked - the reason was the involvement of a third party. Credit card payments were unsecured, users shared too much data and provisions were too high for potential users[1]. Blockchain network cannot be called innovation, because it is based on mathematic, cryptography and information technology well known from years. It can be used to develop new technological solutions of an innovative nature. Innovations based on developing technologies are a dynamic phenomenon also shaping the finance landscape[2]. Fundamentally, it is an improvement over the way that, traditionally, databases have been designed and used in the past[3].

The term *blockchain technology* refers to the way that data is stored. Transactions are recorded in time-stamped "blocks" and each block is connected to previous blocks, forming a chain of transactions. This chain of data is stored by all users on a network; every time a new block is verified and added, the entire chain is updated simultaneously across all network users[4]. Blockchain allows for introduction of a database that functions like a distributed network, hence the term *distributed ledger* - with the promise of near friction-free cooperation between members of complex networks that transfer value to each other without central authorities or middlemen. The significant value of blockchain technology is its ability to deploy cryptographic mechanisms to reach consensus across parties in the ledger. The network eliminates the need for a central authority or intermediary, thereby creating a distributed trust system of value transfer[5]. First of all, blockchain is a decentralized and distributed database in an open source model in a peer-to-peer[6] (P2P) network without central computers and without a centralized storage space. It is primarily used for accounting individual transactions or assets using cryptographic algorithms, made public on the Internet.

[1] Tapscott D., Tapscott A., 2016, The Impact of the Blockchain Goes Beyond Financial Services, Harvard Business Review, https://hbr.org/2016/05/the-impact-of-the-blockchain-goes-beyond-financial-services (access: 21.09.2019).

[2] Report PwC, 2016, Financial Services Technology 2020 and Beyond: Embracing Disruption, 2016, https://www.pwc.com/gx/en/financial-services/assets/pdf/technology2020-and-beyond.pdf/ (access: 21.09.2019).

[3] Morgan Stanley, 2018, Global insight: Blockchain in banking: Disruptive threat or tool?, Global Financials/FinTech, Morgan Stanley Global Insight pp. 28, available online http://www.the-blockchain.com/docs/Morgan-Stanley-blockchain-report.pdf (access: 19.09.2019).

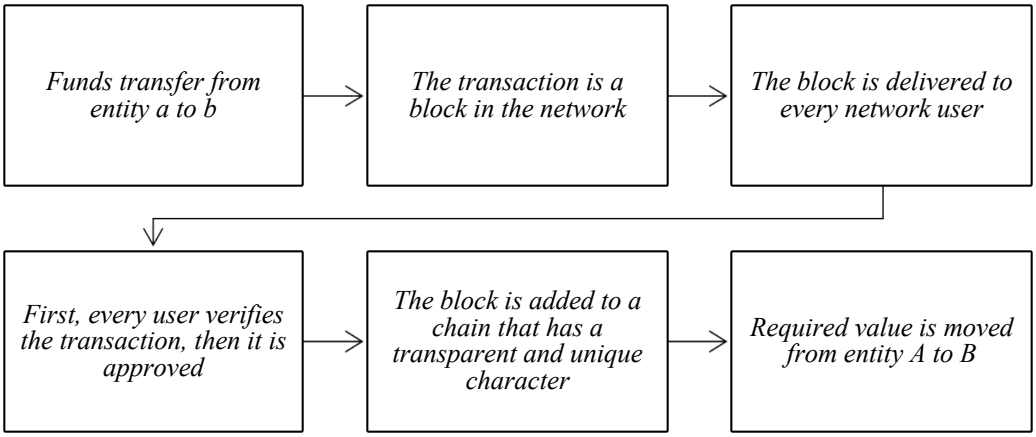
[4] Ramachandran V., Rehermann T., 2017, Can Blockchain Technology Address De-Risking in Emerging Markets? International Finance Corporation – World Bank Group, Washington 2017 pp. 23.

[5] Casey M., 2018, The Blockchain: Decentralized Trust to Unlock a Decentralized Future, O'Reilly, https://www.oreilly.com/ideas/the-blockchain-decentralized-trust-to-unlock-a-decentralized-future, (access: 22.09.2019).

[6] Peer-to-peer is model of communication in a computer network. The model is a guarantee that both parties possess equal rights as opposed to the client-server communication model. That means as thanks to P2P every user of blockchain network can not only receive data, but also send it to the other party at the same time.

Blockchain is a digital ledger, a collection of many records with verifiable integrity. The technology uses a global distributed network to record transactions in such a way that they cannot be altered once approved[7]. How the blockchain technology works? Blocks - the blockchain entries, are added and can be seen by every participant of the network. Each block (the information included on it) is validated by the nodes in the blockchain network before it is approved. In the moment when all of the nodes arrive at a consensus, the block is verified and added to the chain of blocks in chronological order to establish the record (i.e., each block contains the identifier of the previous block in the chain)[8]. The decentralization of the blockchain technology, without a central authority approving the transactions, means that all of blocks within the relevant network cannot be tampered with and that the behavior of the system cannot be modified[9]. The mechanism of adding blocks to the chain is shown in figure 1.

Figure 1.
The blockchain mechanism



Source: Own study

The key elements of a blockchain-based ledger, those that will enable future efficiency gains, are the distributed nature of the ledger, its immutable character, and the existence of an agreed-upon consensus mechanism. Thanks for that it is possible to automate transactions, providing for close to real-time settlement, while

[7] Kokina J., Machna R., Pachamanova D., 2017, Blockchain: Emergent Industry Adoption and Implications for Accounting, Journal Of Emerging Technologies In Accounting, Vol. 14, No. 2, pp. 91–100.

[8] One of the most interesting fact is a blockchain construction can be comparable with the structure of polymers. The main feature of both entities is the chain structure and the process of creating a new chain. There are three phases in this process: initiation, propagation and termination. For polymers, initiation means generating a chemically reactive molecule. For cryptocurrencies, this is the generation of the first block. The second phase is chain propagation. For polymers the phase means an increase in molecular weight. For cryptocurrencies, it means an increase in data size. The last phase is chain termination. For polymer it is the disappearance of chemically reactive molecules. For blockchain technology, termination can be caused by code errors preventing further network functioning.

[9] Ibidem.

maintaining strong control mechanism against fraud[10]. The table 1 includes all the most significant characteristics of the blockchain technology.

Table 1.
Characteristics of blockchain technology

	Feature	Description
1	Decentralization	The basic feature of blockchain technology means that blockchain no longer has to rely on a centralized node, data can be recorded, stored and updated in a distributed manner. Every new block contains the hash of the previous block.
2	Transparency	Every record of data in the blockchain network is transparent for each node also during data update, which increases the level of trust.
3	Access	Public. Most blockchain systems are open to any user, the data record can be checked publicly, and each user can also use blockchain technology to create any application.
4	Autonomy	Due to the consensus, each node in the blockchain system can safely send or update data, any change is visible to other users.
5	Stability	All records will be kept forever and cannot be changed unless someone can take control of over 51% of the node at the same time.
6	Anonymity	Blockchain technology has solved the problem of trust between a node and a node, therefore data transmission or even a transaction can be anonymous, just knowing the key of the person with whom the transactions are concluded.

Source: Own study based on Iansiti M., Lakhani K., 2017, *The truth about blockchain*, Harvard Business Review, https://hbr.org/2017/01/the-truth-about-blockchain (access: 21.09.2019).

Blockchain algorithms enable transactions to be aggregated in blocks and these are added to a chain of existing blocks using a cryptographic signature[11]. Blockchain is a decentralized electronic database. This database is based on the records of subsequent data blocks, each of which contains information about the performed operation (along with the date and result) and is associated with the previous and next block as links in a chain. Blockchain transactions are tamper-proof and fraud-proof because they are constantly confirmed by a decentralized network of computers running in peer to peer architecture[12]. No matter who is involved and how blockchain works, it should be treated primarily as a challenge for business models and rules, law, governments and every network user.

[10] Lewis R., McPortland J., Ranjan R., 2017, Blockchain and Financial Market Innovation, Economic Perspectives, Vol. 41, No. 7, pp. 45-56.

[11] Report Distributed Ledger Technology: beyond blockchain, 2018, UK Government Chief Scientific Adviser, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf (access: 21.09.2019).

[12] Report Blockchain, tokeny i kryptowaluty. Jak to ugryźć?, 2018, Rzeczpospolita, https://newtech.law/wp-content/uploads/2018/07/Blockchain-tokeny-kryptowaluty-jak-to-ugryźć.pdf (access: 21.09.2019).

2. The potential of blockchain technology in finance industry

First practice application of blockchain technology are cryptocurrencies that are recently experiencing an unprecedented rise. Cryptocurrency themes are very popular, however require research skepticism. It is very difficult to describe blockchain technology without cryptocurrencies, which are one of the most popular solutions based on blockchain. Though many challenges in the context of law, business model and science, there are many projects conducted within global corporations in order to develop practical applications of blockchain network. In the present techno-political moment it is clear that ignoring or dismissing the hype surrounding blockchain is unwise, and certainly for regulatory authorities and governments who must keep a grip on the network and those promoting it, in order to ensure democratic accountability and regulatory legitimacy within the blockchain ecosystem.

Blockchain is reconfiguring the global economy, though often in contradictory ways. Blockchain technologies are disrupting key economic and financial sectors. Some blockchain applications allow for democratization of finance, services, agriculture, and governance, yet they may also deepen inequality and weaken democracy[13]. The decentralized structures of blockchain technology tends toward democracy and, therefore, one possible blockchain future features a great global expansion of cooperative forms of ownership and management of wealth[14]. Use cases based of blockchain technology are relatively simple to design and implement, and which are combined with already tested technological solutions such as cryptocurrencies, will likely find early adoption (for example, adding a digital currency payment option for wallets and cross-border payments). Intraorganizational projects within global business intended to reduce complexity in organizations and reconcile multiple databases would be another possibility[15]. It is very probably that blockchain is an answer for ineffectiveness[16] of traditional models and systems, inappropriate for troubles caused by financial crisis. Blockchain is a promise of cost reduction, elimination of intermediaries, increasing of efficiency and transparency therefore is very useful for financial sector.

Blockchain - due to its architecture - guarantees safe and trustless assets transfer was first used in the financial services industry, where it has been enabling digital payment systems and remittances as well as testing more complex financial instruments and transactions such as insurance, deposits, lending, capital raising, and investment management. From the financial sector perspective blockchain technology is the most attractive tool for global payments, trade finance and automated compliance[17].

Financial services firms are extending that kind of collaboration to trusted counterparties to reduce costs through private blockchains. Truly disruptive

[13] Herian R., 2018, Regulating Disruption: Blockchain, Gdpr, And Questions Of Data Sovereignty, Journal of Internet Law, Vol. 22 Issue 2, pp.1-16.
[14] Block F., 2008, Swimming against the current: The rise of a hidden developmental state in the United States, Politics & Society, 36(2), pp. 169–206.
[15] Iansiti M., Karim R., Lakhani R.. 2017, The Truth About Blockchain, Harvard Business Review, 95 (1), pp. 118-127.
[16] In financial services, for example, the existing infrastructure is shallow in almost all low-income countries, many of which have also suffered from de-risking in the wake of the financial crisis.
[17] Swan M., 2015, Blockchain: Blueprint for a New Economy, San Francisco, CA: O'Reilly Media, pp. 34.

blockchain solutions that depart from existing business practices carry high potential for future growth, but their heightened complexity and need for stakeholder collaboration (such as elaborate financial instruments and smart contracts) will likely delay their adoption. Following M. Niforos and her researches within financial sector are two main blockchain initiatives[18]:

- ***Process efficiency rationale***

Which occurs in countries with established financial market leaders (typical in OECD countries). Blockchain projects in such cases focus on a gradual application of the technology, leveraging process efficiencies in existing business models and utilizing private or semi-private blockchains, either within their organization or through consortia such as R3, Hyperledger, and Digital Asset Holdings.

- ***New market creation rationale***

In which new market players target the inefficiencies of existing business models to deliver value in emerging markets. These can be start-up businesses originating from advanced or from emerging market economies, or large non-financial players that see an opportunity in expanding the value chain of a current service. As examples it can be provided: global payments, or remittances, and digital wallets. To cover the area of this paper some of use cases based of blockchain technology has been examined. All examples presented in this article are the author's subjective choice. Criteria of choosing solutions for research sample are as follows:

- usefulness of the solution;
- potential and realized benefits for business and process owners;
- complexity of the solution.

First example to analysis is Abra designed to reduce the fees paid by users sending remittances. Abra is the first and only all-in-one global app offering a true crypto exchange and digital wallet making cryptocurrency investing simple. Abra[19] empowers users to buy and hold 30 cryptocurrencies and 50 fiat currencies on a single app. Exchanges between multiple cryptocurrencies are easy, secure, and quick. In addition, with the Abra app, consumers can manage all crypto investments on one special screen. Applications based on blockchain technology like Abra are expressly intended to disrupt the $600 billion remittance industry. Abra charges users no transfer fees, and 2% to add and withdraw money instead of the traditional 10%. Users access the application on a smartphone. Additionally, money sent via blockchain application can take minutes instead of the days or even weeks that traditional banks may take to clear an international exchange[20].

As the next interesting example is RippleNet[21]. A company Ripple and developed apps RippleNet enable banks, payment providers, digital asset exchanges and corporates to send money globally using advanced blockchain technology. Ripple is a real-time gross settlement system, currency exchange and remittance network created by a technology company from USA Ripple Labs Inc.

[18] Niforos M., 2017, Blockchain in development: part II - how it can impact emerging markets?, EMCompass; no. 41. Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/649111502949149231/Blockchain-in-development-part-II-how-it-can-impact-emerging-markets (access: 22.09.2019).

[19] More information related to Abra app and company are available on webpage: https://www.abra.com.

[20] Manski S., 2017, Building the blockchain world: Technological commonwealth or just more of the same? Strategic Change 26(5) pp.511-522.

[21] More information availabe at: https://www.ripple.com

The organization is built upon a distributed open source protocol, and supports tokens representing fiat currency, cryptocurrency, commodities, or other units of value such as frequent flier miles or mobile minutes. First of all, RippleNet should be treated as a network of institutional payment-providers such as banks and money services businesses that use solutions developed by Ripple to provide a frictionless experience to send money globally[22].

The last example solution based on blockchain technology is one of the most popular on polish market called Billon. Following by the information provides on the main webpage, Billon is a solution created as a high-performance DLT system. The main aim is unification of national currency[23] transactions, documents on-chain, and identification management into a single platform. Billon developed the initial assumptions of blockchain technology, creating a new protocol that allows saving national currencies in accordance with regulations. It was the first subject which created a scalable micropayment solution. The company prepared solution dedicated to storage documents and data in the blockchain structure. This technology allows you to store digital money in the form of encrypted files on our devices. In the table 2 a simple comparison these three solutions has been included.

Table 2.
Abra, RippleNet and Billon – comparison

Criterium	***Abra***	***RippleNet***	***Billon***
Usefulness	All in one = crypto exchange and digital wallet	Unification of global payments	A single platform for currency transactions, documents on-chain, and identity management
Benefits	Costs reduction; time saving	Costs reduction; reliable; instant; global	High performance; immutability in combine assets and values;
Complexity	Quite simple for end user	Advanced tool based on DLT	Simple for users

Source: Own study based on https://billongroup.com/en/technology/ (access: 21.09.2019); https://www.ripple.com (access: 21.09.2019); https://www.abra.com (access: 21.09.2019).

Blockchain is a new technology with the power to disrupt existing business and economic models existed in the global economy. It is a fact as the financial industry has been an early experimenter on and adopter of blockchain technology. In blockchain technology financial industry has found many important areas to develop i.e. trustless, elimination intermediaries, costs reduction. Financial institutions around the world find their business models continually tested by technological innovation. The emergence of blockchain technology, should be treated as challenge for traditional players in the sector by demonstrating new ways to deliver value across the traditional financial value chain.

[22] https://cointelegraph.com/ripple-101/what-is-ripple (access: 22.09.2019).

[23] Billon Solutions Sp. z o.o., a company from the Billon capital group, on April 23, 2019, obtained the permission of the Polish Financial Supervision Authority to operate as a domestic e-money institution. This is the first permit of this type issued in Poland by the PFSA. This is the first authorization in Poland for an issuer of electronic money based on blockchain technology. Thanks to the permit, Billon will be able to provide electronic money services throughout the EU.

3. Classification model

Evidently there is an area to prepare research in the context on universal method in order to describe and classify solutions available on the market which based on blockchain technology. In particular, the author is trying to propose a simple model dedicated for improving the decision-making process in business. Blockchain and the technological potential actively explored within financial sector and whole business require creation of methods, tools and expert knowledge to build added value for stakeholders, end users, governments etc. First of all, it is needed to present example "classification methods" available in the literature, which has been shown in the table 3.

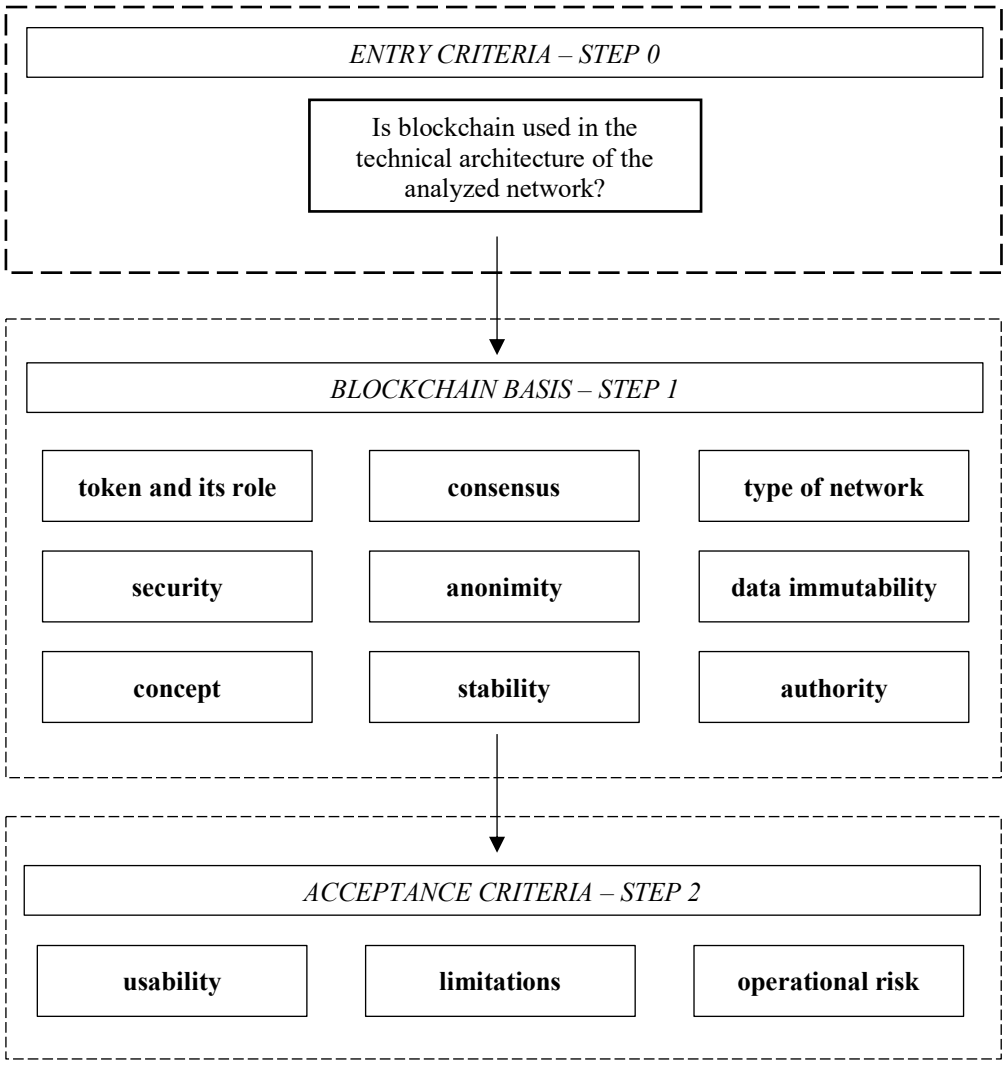
Table 3.
Blockchain technology classification

Criterion	Description	Examples
Accessibility	public; private; hybrid	Bitcoin; Hyperledger
Characteristics	public; private; federated	R3; Ripple; Energy Web Chain
Permissions	permitionless; public-permissioned; private-permissioned	Bitcoin; Blockstream; Eris

Source: Own study based on https://medium.com/the-mission/a-brief-history-of-blockchain-an-investors-perspective-e9b6605aad68 (access: 22.09.2019); https://www.sciencedirect.com/science/article/pii/S0736585318306324 (access: 22.09.2019).

Examples presented above are only small sample, but it is needed to outline that the literature sources feature information overload, unstructured and untested. To allow for describing and classifying blockchain networks the original method has been developed. It contains of three steps. The first step is called "Zero". It this step given solution is analyzed in the context of whether within the network a blockchain has been used. It can be treated as "entry barrier". There are many tools in which using the term blockchain technology is only dedicated for marketing and to increase revenues and interest of stakeholders. Moreover, there are many implementations in which blockchain is added to the traditional solutions. Main tool, idea, technology remain unchanged and blockchain is only added to create a system with deceptively innovative character. Using step "Zero" is contractual in nature. The author assumes that each of the tools considered in the analysis fulfills this assumption. Second step, second check point, called "1" is related to basic requirements (assumptions) on which the technology is based. In case of omitting any of the criteria the analyzed solution should not be treated as blockchain. This procedure goal is to show the differences between the available solutions and exposure misuse in connection with the use of the term 'blockchain'. When a given network is classified as blockchain, it can then be evaluated by the last procedure step called "2". In this step the acceptance criteria have been proposed. They are related to further development and usability for the end user. Step "2" has been created to show if analyzed network is able to cover end user's requirements. Three steps as a whole form a blockchain classification model shown in figure 2.

Figure 2.
Classification model for blockchain technology



Source: Own study

The method (model) presented above allows for classification of networks which are not blockchain rather than using blockchain technology within concept. First step allows for dividing the available solutions into two groups: related to blockchain technology and not related. Then, the analyzed network is explored by second check point. The technology cannot exist without characteristics mentioned in this point. For the second step there are following criteria:

- **Token and its role.** This feature is related to the fact that physical and digital assets are represented by "tokens" (a share, a part) of value on the shared distributed registries, allowing the tokens to be directly traded among network participants. In essence, these core capabilities allow for the use of cryptocurrencies (e.g. Bitcoin, Ether) as well as tokenized digital records (e.g. property rights, physical property rights) in the context of the infrastructure lifecycle, from financing, and procurement, through tendering and operations. Token should be defined as a unit of value stored digitally in the blockchain database. As part of the developed operating principles of a specific blockchain database, tokens can be given value, which is why tokens are often called virtual

currency. Token becomes an indisputable carrier of value, used in many very different business models, in which the principles of distribution, inflation or acquisition ("mining") give individual characteristics to individual projects whose value the tokens represent[24].

- **Consensus mechanism.** Consensus is the most important element of any blockchain network. This is the way in which all nodes in the network decide whether a specific operation (e.g. sending information or tokens) can be accepted and added to the data block and therefore irrefutable. Consensus is embedded in software and does not require individuals or institutions to achieve it. The consensus depends not only on how secure a given blockchain network will be, but also how quickly it will be able to approve subsequent operations and how much will cost its users. Currently, the most popular ways to reach a consensus are: Proof of Work (PoW), Proof of Stake (PoS) Delegated Proof of Stake (DPoS), Proof of Authority (PoA)[25].
- **Type of network – decentralized or distributed.** The concept of a decentralized system is based on peer-to-peer equality. Often in such a network there is a lack of dedicated servers, and each computer (peer) is both a client and performs the functions of a server. This means that none of the system participants will be able to make changes to the network without the knowledge of another users[26]. A distributed database is basically a database that is not limited to one system, it is spread over different sites, i.e., on multiple computers or over a network of computers. A distributed database system is located on various sited that don't share physical components. This is required when a particular database needs to be accessed by various users globally. It needs to be managed such that for the users it looks like one single database[27].
- **Security.** Blockchains are secured through a variety of mechanisms that include advanced cryptographic techniques and mathematical models of behavior and decision-making. Blockchain technology is the underlying structure of most cryptocurrency systems and is what prevents this kind of digital money from being duplicated or destroyed. In the context of blockchain technology and the model presented in this article is crucial to underline as data inputted into the network are saved permanent and no one is able to use it in undesirable way.
- **Anonymity.** This criterium means that blockchain gives for all of users involved a guarantee of anonymity. Blockchain network due to encryption based on complex and robust cryptographic principles, can frequently be obfuscated quite effectively in a way that transactions and data cannot be traced back. To make blockchain completely anonymous and private in nature depends on what kind of cryptographic algorithm has been used for setting up a certain network.
- **Data immutability.** Immutability should be defined as the ability of a blockchain ledger to remain unchanged, for a blockchain to remain unaltered and indelible. Data saved in the blockchain cannot be altered. Each block of data, such as facts or transaction details, proceed using a cryptographic principle or a

[24] Report PIIT Blockchain w Polsce, PIIT, Warszawa 2018 pp. 23.
[25] Ibidem.
[26] Dikariev H., Miłosz M., Blockchain technology and its application, Institute of Computer Science, Lublin University of Technology, Journal Computer Science Institute, nr. 6 Lublin 2018 pp. 61.
[27] Prinz W., Rose T., Osterland T., Putschli C., Blockchain, (in:) Neugebauer R. (eds) Digital Transformation, Springer Vieweg, Berlin, Heidelberg, 2019 pp. 301-309.

hash value. The hash value consists of an alphanumeric string generated by each block separately. Every block not only contains a hash or digital signature for itself but also for the previous one. This ensures that blocks are retroactively coupled together and unrelenting. This feature of blockchain technology ensures that no one is able to intrude in the system or alter the data saved to the block.

- **Concept.** In this criterium is important how the solution (technology, tool, network) is developed. It is crucial how it works and if blockchain is used to improve traditional system. On the market are many networks called "blockchain", which are not blockchain or only a part of this networks can be treated as blockchain. There is a need to understand background and basis of this technology to classify analyzed network as blockchain.
- **Stability.** For the finance sector stability can be identified with reputational factors. This factor is important in the context of cooperation with clients. Blockchain gives its users a promise of stability. Data cannot be modified, rules are clear, ownership is defined, assets are safe.
- **Authority.** One of the assumptions used to develop blockchain technology is that blockchain operates autonomously, without centralized supervision. Traditional systems are supervised by a parent unit. In the blockchain technology all users are entitled to authorize a new transaction. The fact as in the network does not work a central unit minimalized a risk of hacker attack. In addition, increases a level of trust and security. Every user possesses its own copy of the database, operates on an equal footing, and can initiate and verify changes. Modifications are possible on the basis of consensus forced by the protocol and in some cases a system of rewards for active participation in the network. Nobody can control the database, but all users have access to all resources.

In the last part of research is crucial to check if the solution, which is blockchain according to analysis made in previous step (step 1), is able to create added value for end user. For this purpose, available networks can be examined in the context of following criteria:

- **Usability.** One of main goals by implementation process is to create added value for end user. That means that implemented network or tool should be able to meet the requirements of end user in the simple and clear way. The solutions based on blockchain technology, especially in the finance sector should be developed not only for financial institutions but also for customers.
- **Limitations.** Carrying out the analysis of the solutions previously classified as blockchains it is needed to outline potential issues related to the technology. In this way a network can be constantly improved, and unnecessary risk can be eliminated.
- **Operational risk.** In this context more precise categories should be introduced, such as: technological risk, human risk, process risk, legal risk and political risk.

The lack of literature focus on building methods to describe a technology as important as blockchain[28] causes challenges for scientist, managers, politicians and

[28] A Financial Times report on the World Economic Forum in Davos, Switzerland, in January 2018 carried the headline „blockchain can no longer be ignored". Further studies in article: Herian R. Taking Blockchain Seriously" available: https://doi.org/10.1007/s10978-018-9226-y (access: 22.09.2019).

all blockchain technology users. Blockchain includes potential, but it cannot be implemented correctly without understanding its basis, benefits and limitations.

Conclusions

The current status of blockchain technology and its implications should be still treated as emerging. Blockchain introduced serious disruptions to the traditional business processes. More to say, it caused a need to create models and methodology allowing for describing and measuring blockchain solutions. The technology is a promise to provide the flowing properties: transparency, robustness, auditability and security. Today in the socio-economic environment there exist many opportunities, potential challenges and limitations for a number of use cases related to blockchain. There is no doubt that blockchain has great democratic and decentralization potential. The method presented in this article is an attempt of measurement model of the value of the solution (blockchain) for the end user. Blockchain technology created enormous amount of interest, especially within finance industry, however this interest should not be treated as enthusiasm rather than curiosity and following by current trends.

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Classification of blockchain technology implementations in finance industry

Summary

Blockchain technology currently receives a lot of public attention with its disruptive potential to rebuild a currently state of economy. While blockchain technology is treated potentially disruptive in socio-economic environment, there is a lack of understanding where and how blockchain technology is effectively applicable and where it has mentionable practical effects. The use of this technology inside many businesses caused a need to create a system of tools and methods allow properly description to generate valuable information for governments, management, customers etc. Due to a lack of information related to blockchain technology it is a must to explore potential of blockchain in the context of risk. This paper examinees a problem of implementation blockchain technology within finance industry. The main aim of the article was to outline how important is to understand potential of blockchain technology and its limitations, therefore the author prepared a model which can be used to classify blockchain technology implementations in finance industry. This study describes existing issues in the financial aspect.

Key words: blockchain, distributed ledger, tokens