BLOCKCHAIN TECHNOLOGY IN BANKING AS A TOOL TOWARDS THE SDGS

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Abstract Purpose of this paper is to investigate potential implications of blockchain in banking and its contribution towards the Sustainable Development Goals (SDGs). We use qualitative analysis based on case study analysis and netnography for determining existing and potential implications of blockchain in banking and their possible contributions towards the SDGs. This paper's originality is finding specific potential contributions of blockchain technology in banking towards SDGs, such as towards ending poverty with increasing financial inclusion, promoting well-being for all with improving banking institutions' performance and towards climate action by reducing banking institutions' environmental print with digitalizing their processes and services.

Keywords:
blockchain, banking, SDGs, case studies, practical implications

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G21, L86, Q01

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1 Introduction

Banking is one of systemically most significant industries in the global economy. It is vital that systemically important industries focus on its contribution towards the SDGs for swifter movemement towards these goals. Blockchain presents significant potential for banking institutions. Banks invest the most in blockchain technology compared to other financial institutions as it offers various implications that could significantly benefit the banking sector. Due to that it poses crucial tool for simpler and more efficient achievement of SDGs (Aysan et al., 2021).

This paper focuses on potential blockchain's contributions to banking industry's movement towards the SDGs. We conduct complex literature review to find particularly to which SDGs and how can blockchain implementations in banking contribute. Purpose is to contribute to better understanding and future seizing of blockchain's potential in banking industry in the context of sustainable development of global economy.

The paper is structured as follows. An introduction is followed by theoretical background and methodology. Then we present results of our findings and conclude with discussion.

2 Theoretical Background

Blockchain is a new type of technology defined as a "type of distributed ledger technology (DLT) in which transactions are validated and recorded in the distributed ledger in separate but connected batches known as blocks" (ECB, 2022). Blockchain presents the most known example of DLT (Garg et al., 2021) and is most known as the infrastructure of cryptocurrencies. Recently, blockchain technologies became an area of interest in the financial industry. Providers of financial services are using it to amplify their data classes security, setups cooperation, as well as for decentralizing their transactions and increasing their safety (Garg et al., 2021). Figure 1 presents investments of leading financial institutions in blockchain enterprises in 2019, by number of investments. Banking industry conducted the vast majority of investments, gesturing blockchain's importance in it.

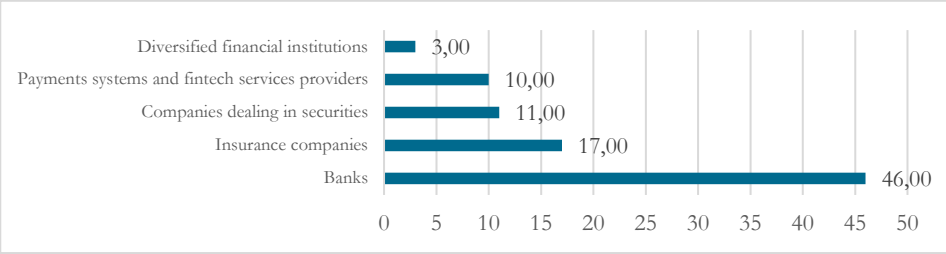

Figure 1: Investments of financial institutions in blockchain technology (in 2019, by number of investments)
Source: (Statista, 2022b; MINDSMITH, 2020).

Blockchain has a wide range of possible implications in banking sector. Firstly, it could reinforce security. Financial crime is a serious threat that is frequently increasing, especially in the form of cybercrime, as digital banking increases in popularity. Europol (2021) states that cybercrime is increasing along with the sophistication of attacks, which are likely underreported. This issue will most likely increase in the future, as Europol expects the use of AI to increase in cybercrime, thus widening the scope and scale of cyberattacks. Blockchain could bring an extra sense of security in banking business models (Hassani et al., 2018; Maiya, 2017), mostly due to the fact that within blockchain technologies, changing historical information is not possible, while any new information is shared with multiple participants, thus the probability for data manipulation is lowered significantly (Hassani et al., 2018). Changes to data are monitored and tracked to prevent fraud and embezzlement and communication and updates are enabled in a timely matter to detect financial crime (Hassani et al., 2018). Blockchain works as a distributed ledger entirely open to network participants. Once the information is registered, it is very challenging to make any changes, thus ensuring built-in security (Garg et al., 2021).

Secondly, blockchain could increase transparency. It could enhance transaction capacities of debit and credit cards. As they increase, so does the importance of transparency. Traditional banking models can be considered secretive, while any alteration of public blockchains is fully viewable. Thus, the challenge of trust in transactions can be conquered with blockchain technology. Additionally, more transparent and quickly viewable auditing can be achieved. Automated financial reporting is another potential benefit, as banks and regulators could communicate

and implement actions much faster in case of compliance violations (Hassani et al., 2018).

Moreover, blockchain could enable faster transactions. Traditional banks have rigorous rules regarding users' transactions, often resulting in delays. Use of blockchain technology offers banks the possibility of speeding up their procedures with direct and frequently updated transactions made immutable with the help of encryption (Hassani et al., 2018).

Further, blockchain has significant potential for reducing banking costs for procedures and transactions (Hassani et al., 2018). Study found blockchain is expected to enable notable cost reductions in banks (Rajnak & Puschmann, 2021). Moreover, Rega (2017) studied 38 banks in European area and found that innovations in technology are positively correlated with profitability of banks. IFC also reported blockchain can lower verification costs in remittance services, as well as other provisions (IFC, 2019).

Lastly, blockchain could better customer verification and KYC, which present great cost for banks. Blockchain could be a lower-cost solution with digital fingerprint. McKinsey estimated blockchain to reduce fraud losses from 7 to 9 billion USD annually, while lowering operating costs of traditional banks up to 1 billion USD (Higginson et al., 2019).

Additionally, blockchain can improve with intelligence and simplify essential elements of financial industry, such as contracts. Due to blockchain, smart contracts created with programming could substantially ease the complexity and time needed for arranging contracts, positively influencing value chains and procedures (Hassani et al., 2018; Rajnak & Puschmann, 2021). Gambacorta (2022) from Bank for International Settlements also noted that smart contracts and DLT in generally could better monetary and financial system's efficiency. Blockchain technology would enable banks to pool large quantities of data and anonymize and protect them with ledger's encryption procedures. With customer consent ensured with smart contracts, banks could view uploaded information from any bank in network, enabling them to make decision faster and more efficient (Higginson et al., 2019).

Thus far, blockchain has been implemented in banking to some extent. State Bank of India developed a blockchain consortium, comprised of 10 banks, intended for financial transactions. Included banks share KYC information, as well as information about terrorism and money laundering situations (Garg et al., 2021, p. 2). The Emirates Islamic bank from UAE as the first Islamic bank implemented blockchain technology for cheque books to better prevent fraud. The South Africa Reserve bank has also used blockchain for their payment transactions, and managed to settle 70.000 transactions in just two hours while ensuring full anonymity (Hassani et al., 2018). Goldman Sachs and J.P. Morgan now have blockchain laboratories. J.P. Morgan partnered up with banks to launch blockchain payments network Interbank Information Network (INN). American Express established blockchain-based payments with Ripple, a fintech enterprise (Osmani et al., 2021). At first, blockchain was not accepted well in the banking and investment industries (Garg et al., 2021), however now it seems financial and banking industry no longer see it as a threat but finally as an opportunity (Osmani et al., 2021). Figure 2 shows that in 2020, the banking industry had almost 30% share in global blockchain spending.

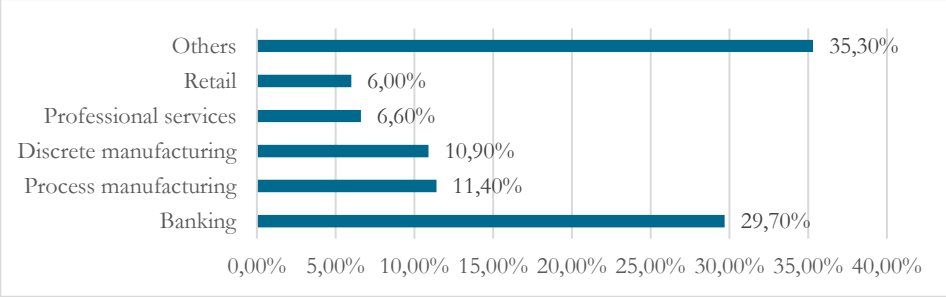

Figure 2: Blockchain market value (in 2020, by sector)
Source: Statista (2022a).

One of the most significant potential implementations of blockchain in banking is in terms of Central Bank Digital Currency (CBDC), electronic version of cash issued by a central bank (Alonso et al., 2021), which could compared to private alternatives such as cryptocurrencies offer more privacy and security (Ahnert et al., 2022). Almost 50% of central banks have already run experiments regarding CBDC or released proofs-of-concept (Syarifuddin & Bakhtiar, 2022), such as People's Bank of China, Central Bank of The Bahamas, European Central Bank and others. Additionally, fundamental question is how it would impact monetary and financial

stability (Alonso et al., 2021). Undoubtedly, it will impact every participant in the financial system. Because of that and their market position banks are aiming to acquire a significant role in the process.

While it promises many benefits, blockchain is not without its challenges, such as limited transaction capacity and scalability (Gambacorta, 2022; Hassani et al., 2018), security, regulation, governance and costs (Garg et al., 2021; Hassani et al., 2018). In terms of SDGs, main concern are higher energy costs (Garg et al., 2021). Analysis such as cost-benefit can determine whether benefits outweight the costs for banks.

3 Methodology

Data included blockchain statistics and studies collected from digital research bases and banks. Research was limited to publicly available data. The methodology is based on qualitative analysis. Firstly, we used netnography for observing online research findings and discussions on blockchain's potential and implementation in banking and towards the SDGs. Secondly, we focused on the case study method, for this purpose we collected data on existing blockchain use in banking sector from various banks worldwide such as State Bank of India, South Africa Reserve Bank, The Emirates Islamic Bank, J.P. Morgan, Goldman Sachs, and others. Lastly, based on both methods, we conducted theoretical inference on possible contribution of blockchain in banking towards achieving the SDGs.

4 Findings

Potentials of blockchain in banking are wide and promising. As such they could be a significant element of banking industry's contribution towards the SDGs (Kewell et al., 2017).

The first SDG is to end poverty. Blockchain can contribute to this goal by increasing financial inclusion. Offering more affordable services to less fortunate might not be cost-effective for traditional banks, processing micro-transactions through blockchain technology could connect smallholders and enable engagement in micro-trade or micro-lending for the fortunate population, which is often overlooked by traditional banks (Aysan et al., 2021). Neobanks, new digital banks often using blockchain technology, offering lower-priced banking products and services, could also be an important tool in lowering banking inequality (Temelkov, 2020). Asian

Development Bank established its blockchain-based decentralized network called Everest. It focuses on cross-border payments through blockchain, while it also enables biometrics verifications, e-wallets and compliance reporting regarding KYC and anti-money laundering (Aysan et al., 2021; Everest, 2023). Blockchain's improvement of management of records and surveillance for banks could enhance their performance and reduce their inefficiencies, which could contribute to third SDG: promoting well-being for all (Aysan et al., 2021). The digital authentication could reduce the need for visits to bank's operating branch, as well as more simple and digital delivery of banking services (Aysan et al., 2021), which would result in lower logistics imprint on the environment, contributing to the thirteen SDG, climate action. By enabling secure digital transfers, it could reduce the range of physical documents, processes and meetings in banking institutions, which would also lower logistics imprint and contribute to the thirteen SDG. Optimizing these processes would make them more efficient, thus contribute to the eight SDG, decent work and economic growth, while also making consumption of energy in banks and their production more responsible, consistently with twelve SDG, responsible consumption and production. By making banking institutions more cost-effective, blockchain could enhance their budget for further investments and donations towards other SDGs, for instance toward resilient infrastructure, fostering innovation, sustainable industrialization and protecting ecosystems and biodiversity loss.

Potential for blockchain's contribution to SDGs extends beyond banking, such as contributing to second SDG, ending hunger, by optimizing global food chain, loss and waste with increased transparency, to fourth SDG by optimizing healthcare processes and raising financing for future development (Aysan et al., 2021).

5 Discussion and Conclusion

The aim of this paper was to investigate possible contributions of blockchain in banking towards the SDGs. Many potential contributions were found, such as increasing financial inclusion and reducing environmental imprint of banking institutions by optimizing and digitalizing their processes. Findings can be used in the development of sustainable practices in banks. Banking institutions, along with blockchain technology, can significantly contribute to global achievement of SDGs. For that reason, SDGs must be prioritized and further researched in the context of banking and blockchain technology.

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