



BLOCKCHAIN IN FINANCE: A BRIGHT FUTURE OR A BLEAK OUTLOOK?

Abstract

Blockchain, the first instance of distributed ledger technology (DLT), has the potential to revolutionise the modern finance industry with advantages such as decentralised control, enhanced transparency, added security, and lower costs. Despite the challenges of lacking regulatory measures and privacy concerns, global institutions have started adopting blockchain in finance to transform their operational models. Although the technology needs to evolve and mature, with potential applications in smart contracts and implications in the metaverse, blockchain technology in finance is here to stay. In this POV, we discuss the importance of blockchain in finance and how it is spearheading the digital revolution in the sector.



Introduction

Innovation is driving the modern world, and the finance industry is no exception. With technological advancements shaping new processes, protocols, and norms, the finance infrastructure has quickly evolved and integrated modern technological solutions for faster, more secure, and

efficient transactions. Blockchain is, inarguably, the innovation that is leading the charge of the digital revolution in the finance industry.*

Blockchain in finance has opened up possibilities for quicker and more secure transactions while reducing fraud and

effectively managing risks across globally interconnected financial systems. As a result, individual consumers, companies, government, and regulatory entities have embraced blockchain technology to bring trust to the financial ecosystem and resist the ever-looming threat of hackers.^{[1][2]}

The digital revolution in finance

Innovation can revolutionise an industry overnight, or it can move forward without notice and become ubiquitous. DLT is one such innovation that has slowly but surely revolutionised the way we look at the finance industry and secure transactions. DLT has its roots in the Roman Empire, which was tackling the problem of creating a consensus of data in a distributed and decentralised manner. In 2008, bitcoin, which refers to a method of storing and organising transaction records in shared and distributed databases, was the first example of DLT. But it drew inspiration

from ideas of tamper-proof digital timestamps, systems of untraceable payments, the use of untrusted distributed servers to build trusted files, and the proof-of-work census model dating back to 1983.^{[3][4]}

With a much broader scope than bitcoin, DLT has ushered in a digital revolution in the finance industry. Offering a secure and tamper-proof way to trade assets and record these transactions across multiple locations in real time, DLT has the potential to disrupt and revolutionise the finance

industry. DLT has already started offering alternatives to traditional trading and investing channels with digital assets such as cryptocurrencies, utility tokens, stablecoins, central bank digital currencies, security tokens, and non-fungible tokens (NFT). As a result, the finance industry is changing with mutualised infrastructure, tokenisation, fractionalisation, and increased access to the private market for individuals.^[4]

Blockchain: The good, the bad, and the ugly

Satoshi Nakamoto is the creator of blockchain, the first application of DLT, and the technology has gained popularity since its introduction via the cryptocurrency bitcoin in 2008. At its core, blockchain comprises individual blocks of data stored in a decentralised network and linked together via chronological links, which are tamper-proof. Because of the decentralised

organisation and storage of the data, no single entity can control or corrupt the data network.^{[1][5]}

Although the original application of this complete, distributed, and unalterable database was cryptocurrencies, the applications of blockchain technology extend far beyond the finance industry. But a majority of the blockchain applications

can be found in the fintech industry as it has provided a new foundation for faster, more secure, more trustworthy, and more efficient transactions. With characteristics such as decentralisation, user anonymity, consensus mechanism, and algorithm- (or rule-) based executions, blockchain is set to revolutionise the future.^[5]

Challenges in blockchain

Despite its futuristic take on global finance, blockchain technology is yet to mature. It can pose some critical challenges, such as:^[5]

- **Scalability:** As the number of transactions increases on blockchain networks, the time to execution increases due to their complex, encrypted, and distributed nature. For example, where Visa can process **24,000 transactions each second** and Mastercard can manage **5,000 transactions**, bitcoin can only process

7 transactions. So, scaling blockchain to process millions of transactions in a matter of seconds is challenging.

- **Security:** Despite the added security layer in blockchain, the nascent technology is vulnerable to attacks. While such a scenario is unlikely, if hackers compromise the majority computing power of the blockchain, they can control the entire blockchain and leave it susceptible to attacks from collusive miners.
- **Privacy leakage:** All the information

about users' transactions and balances is open to the public. Despite masking the real identity of the users, this can direct hackers to users' profile and leave them vulnerable to information leakage and information security concerns.

- **Energy consumption:** As the computing power needed to support blockchain continues to grow, it reflects equally in power consumption. Blockchain networks consume **102.11 terawatt-hours** of energy annually, making it an environmental burden.^[6]



Risks and ethical issues of blockchain

Blockchain is likely to make the traditional financial and banking infrastructure vulnerable by influencing the bottom line with lower transaction volume and transaction-based revenue. With the challenges listed above, come the risks and ethical issues to manage — when using blockchain technology — such as:^{[1][5]}

- **Privacy concerns:** Blockchain networks create permanent and immutable public records of each transaction. The focus on transparency makes confidentiality challenging, leading to

privacy concerns for users.

- **Legislative and regulatory compliance:** Blockchain technology is evolving rapidly, and the legislative and regulatory bodies are struggling to catch up. As blockchain-based digital assets are so new that many government bodies and financial institutions are yet to recognise cryptocurrencies as legal tender and haven't passed any laws and regulations to oversee blockchain transactions, which is a major hindrance in the global

financial ecosystem.

- **Cybercrime:** As blockchain does not have stringent protocols surrounding user authentication, cryptocurrencies have become the payment method for criminals. Blockchain networks are left vulnerable to use by criminals for money laundering, tax evasion, or terrorist funding as the use of blockchain networks is still largely regulated by the ethics of its users.

The benefits of blockchain

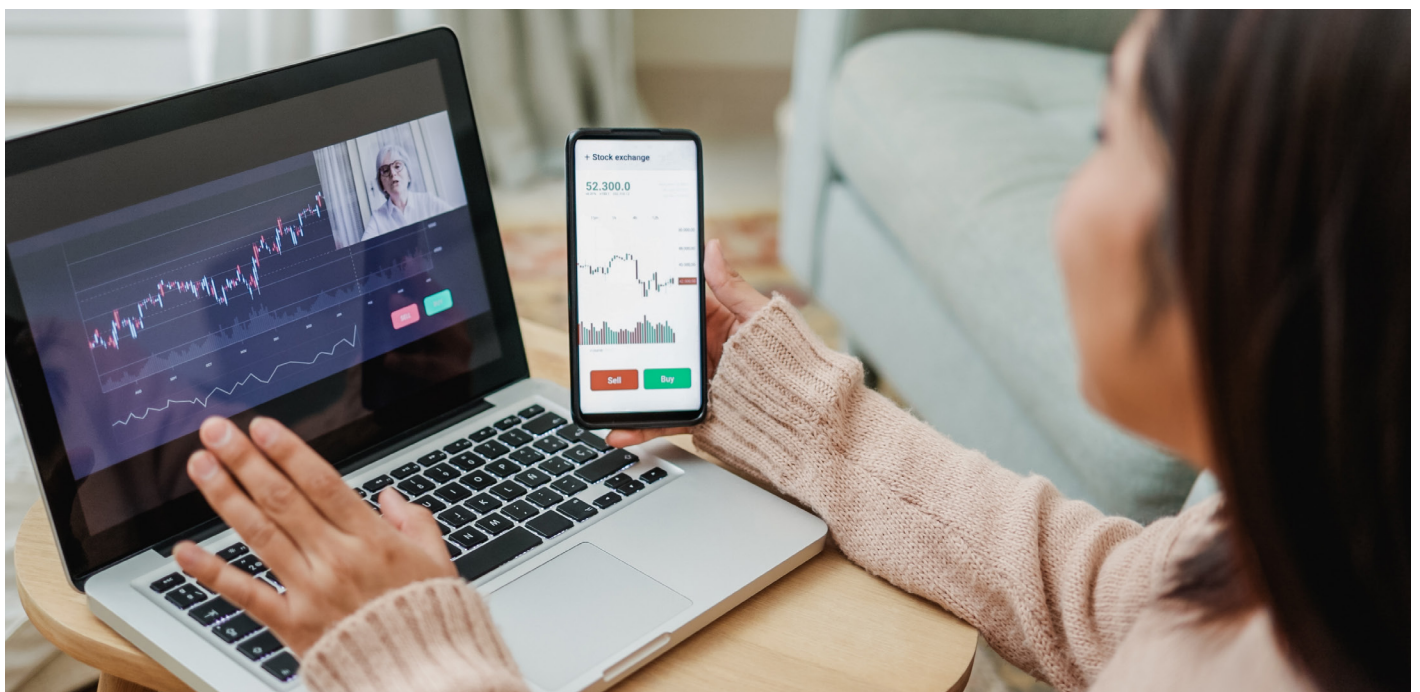
Blockchain technology offers many advantages to its users, such as:^[1]

- **Enhanced transparency:** As users rely on public distributed ledgers, blockchain can add transparency to their transactions. This enhanced transparency can also help detect issues such as fraud and allow financial institutions to take corrective measures while lowering risk.

- **Added security:** The digital revolution in finance has brought about an onslaught of scammers. Blockchain technology can combat this issue while providing additional security via faster and more traceable transactions. Distributed networks and cryptographic algorithms for information exchange make blockchain technology even more secure than traditional transaction

channels.

- **Lower costs:** Blockchain offers the opportunity for everyday investors to avoid the high fees of financial advisors and assess the financial services environment at lower costs.



Blockchain in finance: Looking ahead

However, despite the risks and challenges, blockchain technology in finance is booming, with more applications of blockchain being introduced every day and shaping the future of finance. Large banks and international financial institutions have started investing in resources and infrastructure that can support the integration of blockchain technology in finance. Although many are now focusing on bitcoin and other cryptocurrencies, it's only a small part of blockchain in the finance industry. For example, one of the potential applications of blockchain is incorporating big data analytics to predict trading activities. With an improvement in blockchain technology, many such opportunities can become available to financial institutions around the globe.^[5]

Responding to the gaining popularity and influence of blockchain, the international finance industry has started evolving its business models and technical characteristics. Outside of the advantages such as reducing costs and value transfers, more effective risk control, and new sources of revenue and profit, blockchain applications are also transforming the way the finance industry handles digital payments and contract execution.^{[4][5]}

For example, take the concept of the metaverse. As it continues to gain interest, the use cases of blockchain in the metaverse are becoming apparent. Digital assets, such as in-game assets, virtual currencies, NFTs, and real estate, use blockchain technology. Beyond these, blockchain is also making other

transactions in the metaverse more secure and trustworthy.^{[7][8]}

Another example of blockchain for financial services is smart contracts. Smart contracts are stored on a blockchain network and are executed automatically once the predetermined conditions are met. A simple code with 'if/when ... then' statements governs these contracts, which offer the advantages of speed, efficiency, accuracy, transparency, trust, security, and cost savings over traditional contracts. Smart contracts available today offer the opportunity to optimise many business and financial processes. They have the potential to transform how parties make and execute agreements in the fintech industry.^{[2][9]}

Conclusion

Blockchain technology has proven to be a disruptive innovation that is slowly transforming the finance industry with the DLT concept. Global banking and

financial institutions are capitalising on the opportunity to transform their business model and technical capabilities. To achieve its full potential, blockchain

in finance needs to develop and evolve further to address the concerns such as lack of scalability, enormous energy consumption, and privacy issues.



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