

ORIGINAL RESEARCH ARTICLE

Exploring the influence of Blockchain in the financial services: Quick assessment of its applications across various financial domains

Kamrun Naher, Mohammad Shamsu Uddin*

Department of Business and Technology Management, Islamic University of Technology, Gazipur 1704, Bangladesh

* Corresponding author: Mohammad Shamsu Uddin, msuddin16@yahoo.com

ABSTRACT

Blockchain technology has evolved from an enigmatic concept to a pioneering new frontier for our collective digital infrastructure in the last two decades. Its vast potential has transcended industries and possesses the capacity to transform domains as diverse as healthcare and online gaming fundamentally. However, Blockchain technology has thus far demonstrated its most efficient and effective application within the financial sector. The financial industry has benefited significantly by adapting this new technology (Blockchain) in terms of transactional transparency, security, and operational effectiveness. Blockchain is made feasible by developing immutable, decentralized, and distributed ledgers that can be viewed in real-time by numerous parties without intermediaries. As a result, transaction processing is secure and dependable, reducing the likelihood of fraud, errors, and delays. Because of their decentralized nature and smart contract technology, these instruments permit the establishment of novel financial services, such as P2P lending, decentralized insurance, and decentralized asset management. Rapid Blockchain adoption revolutionizes the financial sector, ushering in a new era of innovation and upheaval.

Keywords: Blockchain-technology; finance; application; cross-border; crypto; digital-assets

ARTICLE INFO

Received: 30 April 2023
Accepted: 29 May 2023
Available online: 12 June 2023

COPYRIGHT

Copyright © 2023 by author(s).
Financial Statistical Journal is published by
EnPress Publisher, LLC. This work is licensed
under the Creative Commons Attribution-
NonCommercial 4.0 International License
(CC BY-NC 4.0).
<https://creativecommons.org/licenses/by-nc/4.0/>

1. Introduction

The finance sector, which manages financial assets and resources, is one of the most critical sectors of the economy. Traditional financial systems rely heavily on transaction facilitators such as banks, stock exchanges, and clearinghouses. However, these intermediaries frequently come with high costs and inefficiency, reducing the public's access to the financial system. Financial Technology (FinTech) employs digital technologies to enhance traditional financial activities, but concerns remain regarding centralization. The financial sector has recently shown increased interest in Blockchain technology, a decentralized solution that eliminates the need for intermediary transaction verification^[1]. According to numerous specialists, the imminent introduction of Blockchain technology is poised to significantly transform the financial sector in the near future. It gives users greater control over their data and transactions across various domains. Notably, autonomous transaction execution eliminates the requirement for intermediaries. The revolutionary potential of blockchain extends to the peripheral world of financial instruments, providing increased effectiveness and efficiency in areas like user authentication, automated data encryption, and thorough data access trail storage^[2]. Blockchain is a distributed database structured as an ordered list of committed, immutable blocks. It's auditing capabilities

and transparency make it ideal for the banking sector, where banks can collaborate and process customer transactions. Organizations are conscious of their intrinsic capacity to disseminate their frameworks, lower the cost of transactions, and enhance security, clarity, and speed. A phenomenon like this shows that Blockchain is more than simply a trend^[3].

The article emphasizes how widely Blockchain technology is being used in different domains of finance. By implementing it, financial service providers can offer consumers more secure and efficient systems with reduced fees, increased transparency, and accelerated transaction processing times. Such applications exhibit the game changing capability of Blockchain technology, as it has enabled substantial enhancements to the provision of financial services, ushering in a new era of more sophisticated and consumer-centric financial products.

2. The integration of Blockchain technology in different domains of finance

Through the recent years, Blockchain technology has caused a stir in the corporate world, providing substantial advantages to companies operating in diverse fields. Blockchain has the capability to reconstruct the way organizations function by reducing supply chain management and enhancing transparency and security. The financial sector has adopted Blockchain technology more quickly than other industries. The financial sector is becoming increasingly interested in embracing Blockchain technology. By incorporating Blockchain, financial institutions can perform multiple services, such as transferring funds, confirming identities, forming contractual agreements, offering insurance, executing smart contracts, conducting auctions, trading currencies, and processing international payments. As mentioned in the study of Weerawarna et al.^[4], “Cryptocurrencies and associated trading platforms, digital asset management and registration, and international payments” are the three most important Blockchain uses in finance.

Cryptocurrencies and associated trading platforms: Blockchain technology is the basis for cryptocurrencies, providing a safe and transparent method for recording and validating transactions on a decentralized network. Cryptocurrencies, on the other hand, are digital or virtual currencies that regulate the formation of units and verify the transfer of payments using encryption techniques. The convergence of Blockchain technology and cryptocurrencies has garnered substantial attention from academic circles and industry practitioners. Cryptocurrencies use the synergistic potential of Blockchain technology and cryptographic methods to facilitate secure and anonymous transactions. Notably, many institutions and countries are starting to understand and incorporate cryptocurrencies into their operational paradigms^[5]. According to a report^[6], “the value of the global cryptocurrency market reached USD 4.67 billion in 2022, and predictions from 2023 to 2030 indicate a progressive compound annual growth rate (CAGR) of 12.5%. In 2022, the overall market capitalization for cryptocurrencies topped USD 800 billion”^[7].

According to the study of Hashemi Joo et al.^[8], cryptocurrencies have four main advantages over other currencies. Mainly, using cryptocurrencies for domestic and international money transfers and payments reduces the need for financial intermediaries or money transfer operators (MTOs), who provide services such as currency trading and transaction settlement. This characteristic is especially advantageous in nations where most people need more accessible access to financial institutions. Second, cryptocurrency transactions are handled and settled faster than regular digital transactions and other conventional means. In addition to shortened transaction times, consumers can save time by submitting transfer requests through digital devices such as smartphones and tablets instead of physically visiting a financial institution, as the SWIFT system needs.

In contrast to conventional ways, thirdly, digital money transfers facilitated by cryptocurrencies can be completed with lower transaction fees or, in many circumstances, no fees. The processing of these rapid, cost-effective, and efficient transactions on a Blockchain network enables them. Lastly, built-in inflation prevention

is one of the most significant features of cryptocurrencies. The central bank can produce fiat currencies at will, making them intrinsically inflationary. In contrast, the supply of cryptocurrencies is limited and regulated, with a predetermined limitation. As a result, no financial entity can alter the total supply of cryptocurrencies. This characteristic gives value security that fiat currencies cannot deliver^[8].

Blockchain technology facilitates the peer-to-peer trading of cryptocurrencies, eliminating the need for intermediaries. Presently, there are approximately 8000 cryptocurrencies on the market, with the top ten mentioned in **Figure 1**. The whole cryptocurrency market is online, necessitating a variety of platforms to allow the trade of digital currencies. The quality of a cryptocurrency trading platform depends on several criteria, including the assets it supports, the fees it deducts, the payment methods it offers, and, most importantly, the level of security it provides. **Table 1** represents different crypto trading platforms of different categories.

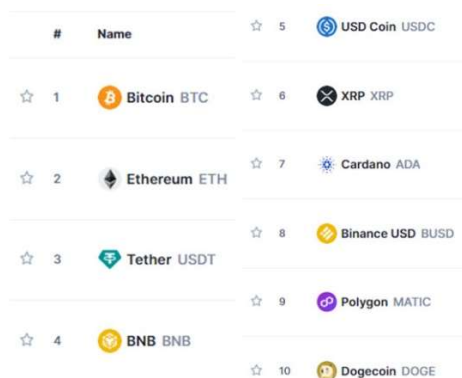


Figure 1. Top 10 cryptocurrencies^[9].

Table 1. Crypto trading platforms.

Categories of platform	Platform name
Low fees and for experienced traders	Kraken
Beginners	Coinbase
Mobile app	Crypto.com
Bitcoins	Cash app
Decentralized exchange	Bisq
Most secure	Gemini
Altcoins	BitMart

Source: Investopedia^[10].

Digital asset management and registration: digital assets are any digital content with a monetary worth that can be traded. This includes digital currencies such as Bitcoin and Ethereum, digital art and music, domain names, and even virtual real estate. Digital asset management (DAM) has never been more vital than now, given the growing prevalence of digital assets across businesses. Coordination, storage, retrieval, and distribution of digital assets are all aspects of digital asset management (DAM). This work can be challenging, especially for businesses that manage a large amount of digital content. However, cutting-edge technologies like Blockchain are streamlining and improving the management of digital assets, making the procedure more fluid and secure.

Businesses increasingly rely on digital assets to run their operations and maintain vital information as the digital era continues to advance. But with the proliferation of digital assets comes the problem of efficiently and securely managing them. The storage, management, and retrieval of digital assets are all centralized under

digital asset management (DAM). One of the most exciting developments in the field of DAM is the use of Blockchain technology for asset registration and management. A secure and transparent process for tracking the ownership and transfer of digital assets materializes thanks to Blockchain's unchangeable record and decentralized features, all without intermediaries or centralized control.

An effective digital asset management system should be able to assign assets methodically to internal and external teams, provide a central location for easy asset retrieval, give owners control over asset access and changes, and include a way to track the evolution of assets over time to maximize their value. The system should ensure the security and integrity of digital assets while enabling effective management, distribution, and application of those assets^[11]. According to Tobin^[12], the State of Illinois has established a Blockchain-based birth registration as a model implementation of a digital asset registry for identification services. Zhang et al.^[13] on his study mentioned that Van Norman and Eisenkot^[14] have illustrated on their work how digital assets may be discovered and registered and how they can be granted exclusive rights to creative works including fiction, nonfiction, music, choreography, and architecture. According to Spencer and Belcher, significant corporations like Amazon.com and Coinbase have filed for Blockchain patents, including patents linked to preserving their digital assets^[13].

International payments: the execution of cross-border payments necessitates using settlement methods and payment systems to permit the movement of capital across different nations or geographic areas in light of international trade and investment agreements. The growing business globalization has further accentuated the importance ascribed to cross-border payments. According to the 2022 McKinsey Global Payments Report, revenue growth in 2021 was 11%, the highest since 2017 and the second-highest since 2000. However, it was anticipated that earnings would decrease due to the COVID-19 outbreak. By 2025, McKinsey predicts that worldwide payments revenue will reach around \$2.5 trillion.

International payments are typically processed through banks, which involve multiple intermediaries, making the process lengthy, expensive, and capital-intensive. As intermediaries store vast quantities of consumer data, the centralized payment system used for international transactions is vulnerable to security breaches. According to research conducted by the World Economic Forum, international payment fees for senders account for an average of 7.68% of the remittance amount, thereby increasing the cost. As per McKinsey, correspondent banks' cross-border payment costs range between \$25 and \$35, which is over ten times more expensive than domestic clearing and settlement payments that utilize Automated Clearing House. This decreases the banks' fund utilization efficiency and raises their hedging and opportunity costs^[15].

The advantages of Blockchain technology over traditional cross-border payment systems are numerous. First, it eliminates mediators, which decreases transaction times and improves efficiency. Second, its transparency decreases expenses and enables peer-to-peer payment arrangements. Thirdly, the distributed architecture improves the system's stability and dependability by preventing single points of failure. Fourthly, transactions are nearly real-time, allowing for faster cash flow and enhanced liquidity. Fifthly, it facilitates monitoring by enabling the storage of all transaction records in the block and verifying the validity and integrity of account material. Sixthly, it facilitates rebuilding the credit system by offering a dependable and comprehensive credit reporting system. Blockchain technology's unique process monitoring and authenticity capabilities make it a possible alternative to conventional cross-border payment systems^[15].

Ripple is emphasized as an example of a Blockchain-focused platform designed for international payments. By using XRP as an intermediary currency, Ripple efficiently speeds up and minimizes the cost of transactional procedures. The fundamental digital currency the Ripple network uses is called XRP, and thanks to its persistent market capitalization, it routinely ranks among the top cryptocurrencies. It offers software that enables banks to connect to the Ripple network and undertake money transmission. Banks function as nodes and manage their accounting systems using cryptographic verification methods. Ripple's newest offering,

XRP, offers nearly quick and inexpensive XRP transfers^[15]. **Figure 2** below represents a cross-border payments solution.

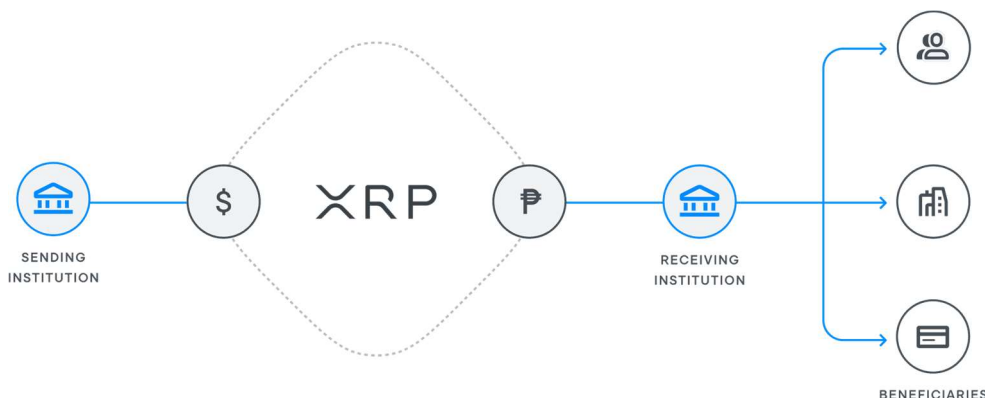


Figure 2. Cross border payments solution^[16].

Managing enormous quantities of financial data is a costly endeavor for financial institutions. As per industry norms, a central authority, such as the central bank, must authenticate each financial transaction. These ancient organizations need interoperability because it is costly to maintain ledgers in isolation. In addition, the current financial operations need more transparency, restrictions on consumer access, and centralized management. Blockchain is increasingly expanding into new financial domains without the three divisions mentioned above. Five additional use case of Blockchain’s potential to transform the financial sector are provided below^[17].

1) Customer Due Diligence (CDD): financial institutions employ CDD to identify, verify, and profile consumers following applicable requirements. The CDD encompasses Know Your Customer (KYC) and Know Your Business (KYB). Financial institutions must implement KYC and KYB processes during customer onboarding to comply with regulatory laws and norms. These procedures are dynamic and demand constant modifications, making it challenging to keep client profiles and documentation current. Blockchain solutions can decentralize and safeguard the KYC process by storing consumer data on a distributed ledger. Blockchain participants can update client information as necessary while guaranteeing consistent and secure KYC/KYB information recording. Blockchain systems offer decentralization, enhanced privacy control, and immutability, enabling accurate client data tracking across financial institutions. Nevertheless, stakeholders continue to argue the erasure of client data upon account closure for GDPR compliance on Blockchain data^[17].

2) Small business credit assessment: most banks view SMEs (Small and Medium-Sized Businesses) as high-risk clients due to more onerous restrictions and diminishing returns on equity. Other data sources, such as social media and the news, are now required for credit rating in addition to traditional finance and accounting information. Blockchain technology reduces the chance of data breaches and makes sure that credit risk assessments are correct by letting multiple parties share credit score information in a safe and efficient way. Emerging companies such as Bloom and PayPie have already utilized Blockchain to create cutting-edge credit-scoring solutions, demonstrating the technology’s revolutionary potential in the credit worthiness assessment and evaluation process. The value of such a Blockchain increases in proportion to the number and volume of contributors^[17].

3) Consumer data analytics and personalized financial products: combining structured and unstructured data from numerous institutions and platforms, Blockchain technology can assist in the secure and accurate profiling of retail customers and businesses. This can assist financial firms in conducting customer-centric analytics and providing customized products and services. Blockchain can facilitate the formation of personal data markets in which users swap access to their data for financial institution-provided incentives^[17].

4) Insurance claims processing: Blockchain technology can improve and optimize insurance claims processing by integrating all relevant parties into a framework of distributed ledger infrastructure and utilizing smart contracts for verification and validation. Exchanging client information on the Blockchain can simplify the arduous process of claims processing, including calculation and validation of the amount to be paid, and prevent fraudulent transactions and claims^[17]. Notably, it automates smart contracts for claims settlement, improving speed and customer service while lowering costs. Blockchain tackles fraud, transparency, and trust issues by boosting customer identity security, creating industry blocklists, and improving mutual insurance mechanisms. The incorporation of electronic medical records and the necessity of a robust Public Key Infrastructure (PKI) serve as additional examples of how technology has the potential to improve health records and foster collaboration, ultimately benefiting the real economy and lowering financial risks^[18].

5) Cooperative security in the ecosystem of financial services: despite increased investments in security, financial institutions are vulnerable to cyberattacks. Collaboration and information sharing regarding the security of respective infrastructures can assist in mitigating such attacks across the financial services value chain. Data exchange is facilitated by Blockchain technologies, allowing for trustworthy collaboration and the construction of a collaborative risk assessment methodology^[17].

In their respective studies, Baiod et al.^[19] and Gu^[20] delve into utilizing Blockchain within the finance sector. Furthermore, additional domains warrant mention beyond the applications mentioned above. These encompass areas are “financial clearance, stock trading, supply chain, digital ticket”. Numerous nations have adopted Blockchain technology into various parts of their national financial systems due to its rising notoriety. In-depth research on its application in Zambia’s financial industry by Neene et al.^[21] reveals its great value in accounting, banking, insurance, taxation, mortgage, and fintech. With its many benefits, Blockchain use is expected to grow internationally, promoting industry developments.

3. Conclusion

The unique characteristics of Blockchain technology, which are characterized by its increased security, increased transparency, and operational efficiency, have piqued the interest of financial institutions to a great extent. This revolutionary potential can also change the financial industry’s landscape, ultimately affecting how we interact with financial services. Streamlining procedures, saving expenses, and strengthening security measures are possible by creating impermeable, transparent, immutable records. Despite the relative newness, it is clear that financial industry is gradually embracing the Blockchain technology. A clear trajectory is envisaged as this technology develops and reaches a higher level of complexity, characterized by more absorption and synergy with financial institutions. The resulting environment is anticipated to have improved effectiveness, strengthened security measures, and a decentralized operational ethos, thus denoting a significant paradigm shift.

Author contributions

Conceptualization, MSU and KN; methodology, MSU and KN; software, MSU and KN; validation, MSU and KN; formal analysis, MSU and KN; investigation, MSU and KN; resources, MSU and KN; data curation, MSU and KN; writing—original draft preparation, MSU and KN; writing—review and editing, MSU and KN; visualization, MSU and KN; supervision, MSU and KN; project administration, MSU and KN. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

References

1. Renduchintala T, Alfauri H, Yang Z, et al. A survey of Blockchain applications in the FinTech sector. *Journal of Open Innovation: Technology, Market, and Complexity* 2022; 8(4): 185. doi: 10.3390/joitmc8040185
2. Ali O, Ally M, Clutterbuck, Dwivedi Y. The state of play of blockchain technology in the financial services sector: A systematic literature review. *International Journal of Information Management* 2020; 54: 102199. doi: 10.1016/j.ijinfomgt.2020.102199
3. Casino F, Dasaklis TK, Patsakis C. A systematic literature review of Blockchain-based applications: Current status, classification and open issues. *Telematics and Informatics* 2019; 36: 55–81. doi: 10.1016/j.tele.2018.11.006
4. Weerawarna R, Miah SJ, Shao X. Emerging advances of Blockchain technology in finance: A content analysis. *Personal and Ubiquitous Computing* 2023; 27: 1495–1508. doi: 10.1007/s00779-023-01712-5
5. Chan S, Chu J, Zhang Y, Nadarajah S. Blockchain and cryptocurrencies. *Journal of Risk and Financial Management* 2020; 13(10): 227. doi: 10.3390/jrfm13100227
6. Grand View Research. Available online: <https://www.grandviewresearch.com/> (accessed on 18 May 2023).
7. Cryptocurrency market size, share & trends analysis report by component, by hardware, by software, by process (mining, transaction), by type, by end-use, by region, and segment forecasts, 2023–2030. Available online: <https://www.grandviewresearch.com/industry-analysis/cryptocurrency-market-report> (accessed on 5 March 2023).
8. Hashemi Joo M, Nishikawa Y, Dandapani K. Cryptocurrency is a successful application of Blockchain technology. *Managerial Finance* 2020; 46(6): 715–733. doi: 10.1108/MF-09-2018-0451
9. CoinMarketCap. Today's Cryptocurrency Prices by Market Cap. Available online: <https://coinmarketcap.com/> (accessed on 18 March 2023).
10. Lielacher A, Rasure E, Klammer MM. Best crypto exchanges of 2023. Available online: <https://www.investopedia.com/best-crypto-exchanges-5071855> (5 May 2023).
11. Zhu Y, Qin Y, Zhou Z, et al. Digital asset management with distributed permission over Blockchain and attribute-based access control. In: Proceedings of the 2018 IEEE International Conference on Services Computing; 2–7 July 2018; San Francisco, CA, USA. pp. 193–200.
12. Tobin A. Our analysis of the EU digital identity architecture and reference framework. Available online: <https://www.evernym.com/blog/> (accessed on 18 March 2023).
13. Zhang L, Xie Y, Zheng Y, et al. The challenges and countermeasures of Blockchain in finance and economics. *Systems Research and Behavioral Science* 2020; 37(4): 691–698. doi: 10.1002/sres.2710
14. Van Norman GA, Eisenkot R. Technology transfer: From the research bench to commercialization: Part 1: Intellectual property rights—Basics of patents and copyrights. *JACC: Basic to Translational Science* 2017; 2(1): 85–97. doi: 10.1016/j.jacbts.2017.01.003
15. Deng Q. Application analysis on Blockchain technology in cross-border payment. *Advances in Economics, Business and Management Research* 2020; 126: 287–295.
16. Ripple. Cross-border payments. Settlement in seconds, not days. Available online: <https://ripple.com/solutions/cross-border-payments/> (accessed on 18 March 2023).
17. Polyviou A, Velanas P, Soldatos J. Blockchain technology: Financial sector applications beyond cryptocurrencies. *Proceedings* 2019; 28(1): 7. doi: 10.3390/proceedings2019028007
18. Chen CL, Deng YY, Tsaur WJ, et al. A traceable online insurance claims system based on blockchain and smart contract technology. *Sustainability* 2021; 13(16): 9386. doi: 10.3390/su13169386
19. Baiod W, Light J, Mahanti A. Blockchain technology and its applications across multiple domains: A survey. *Journal of International Technology and Information Management* 2021; 29(4): 78–119. doi: 10.58729/1941-6679.1482
20. Gu S. Research on the application of Blockchain technology in the financial field. *BCP Business & Management* 2023; 44: 457–463. doi: 10.54691/bcpbm.v44i.4855
21. Neene V, Ng'uni A, Jere B, et al. Blockchain technology and its implication for the financial sector in Zambia. *Zambia ICT Journal* 2022; 6(1): 52–60. doi: 10.33260/zictjournal.v6i1.139