American Journal of Financial Technology and Innovation (AJFTI)

ISSN: 2996-0975 (ONLINE)

VOLUME 4 ISSUE 1 (2026)

PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

American Journal of Financial Technology and Innovation (AJFTI)

Volume 4 Issue 1, Year 2026
ISSN: 2996-0975 (Online)
DOI: https://doi.org/10.54536/ajfti.v4i1.6439
https://journals.e-palli.com/home/index.php/ajfti

Application of Blockchain Technology into Public Sector Accountability and Financial Reporting Transparency in Bangladesh.

Prasenjit Sarker[1*], Chironjit Sarker[2], Md. Abu Hanif[3], Khadija Huq[4]

Article Information

Received: February 25, 2024

Accepted: March 14, 2024

Published: January 20, 2026

Keywords

Blockchain, Data Reliability, Data Traceability, Financial Reports, Window Dressing,

ABSTRACT

Accessibility to authentic and reliable financial reports is sin qua non for investors, consumers or any other stake holders, ensuring data credibility, real time data traceability making shield against corruption and window dressing. Nowadays, the surge of real-time data traceability has become a very significant factor, while blockchain technology undoubtedly plays a pivotal role as the data protector. In this study, it has been shown that how blockchain technology can be coined with operating system to protect and provide reliable financial reports to the stake holders connected to the public sectors of Bangladesh.

Moreover, a proper frame work about how authentic and reliable financial reports can be provided to public sector stake holders has been proposed. In this frame work, different levels of service providers and analysists remain connected to one another providing data collected from field levels and analyze this data to make the proper reports to the superior level without data manipulation and thus ensuring data reliability. All participants in the frame work remain connected to the operating system, distributed ledger, and cloud computing as well. Nods are designed to stay at different levels to permit data to be incorporated and thus to ensure that data is protected from hacking, window dressing etc. This study thus helps to explore how blockchain technology, coupled with data science, can play a pivotal role in generating proper financial reports and making them available to its stakeholders in real time.

INTRODUCTION

Data Transparency and Data Traceability is sin qua non for ensuring accountability against data manipulation. Window Dressing has been the growing concern to depict data accuracy along with proper financial reporting especially in public sector where corruption hinders the development of country's economy. In 2008, the release of Satoshi Nakamoto's groundbreaking whitepaper gave rise to blockchain technology, which fundamentally changes the way transactions are tracked, validated, and protected. Fundamentally, blockchain is a distributed, decentralized ledger technology that makes it possible to record transactions across a network of linked nodes in a transparent and unchangeable manner. Decentralization, immutability, transparency, and security are among its guiding concepts. By dispersing the ledger throughout a network of participants, decentralization removes the need for middlemen and lowers the possibility of fraud and manipulation. Immutability improves the integrity and dependability of the ledger by guaranteeing that data on the blockchain cannot be changed after it has been recorded. Real-time transaction visibility to all network users promotes accountability and confidence, which is how transparency is accomplished. Consensus processes and cryptographic hashing are two examples of security procedures that protect the blockchain from fraud and illegal access. Since its conception, blockchain technology has expanded to include a wide number of sectors and use cases, going beyond its initial application in cryptocurrencies like Bitcoin (Prokopenko *et al.*, 2024). For centuries, manual operations and centralized systems were the primary sources of financial transaction recording, reporting, and auditing in traditional financial accounting (Kokina & Davenport, 2017). Financial accounting is the primary source of information for economic decision-making, as it provides timely and precise data on the entity's financial performance and viability (Horngren *et al.*, 2013). Generating financial reports that reflect the organization's financial position, orderly logging of transactions according to established accounting norms, and maintaining adherence to legal requirements are the major goals of financial accounting (Needles *et al.*, 2014).

Nevertheless, among traditional accounting practices, inefficiencies in data reconciliation, vulnerability to fraud and mistakes, and the non-existence of real-time transparency are some of the definite drawbacks (Prokopenko *et al.*, 2024; Rozario & Thomas, 2019). These difficulties have necessitated studying new technologies such as blockchain to develop methods that will transform financial accounting practices (Schmitz & Leoni, 2019). Furthermore, the use of blockchain technology will enable the creation of financial statements that are accessible, trustworthy, and accurate, thereby improving the quality of decisions and the trust of stakeholders (Dai & Vasarhelyi, 2017; Moll & Yigitbasioglu, 2019).

The problem statement outlines the urgent need to develop more innovative financial accounting procedures

[1] Officer, Janata Bank PLC, Bangladesh
[2] Department of Accounting, University of Dhaka, Bangladesh
[3] Assistant Professor, Sonargaon University, Dhaka, Bangladesh
[4] Foreign Teacher, The Camfirst School, Cambodia
[*] Corresponding author's e-mail: prasenjitsarker48@gmail.com

and how the use of blockchain technology will help in overcoming many issues that conventional accounting systems face today (CPA Journal, 2020). In the last few years, inefficiencies of traditional accounting techniques have become more pronounced: data reconciliation problems, susceptibility to fraud and error vulnerabilities, and lack of real-time transparency (Prokopenko *et al.*, 2024; Rozario & Thomas, 2019). These challenges have brought discussions about the need for radical solutions aimed at enhancing the effectiveness, reliability, and transparency of financial reporting processes to the fore. In this respect, blockchain technology presents opportunities as an alternative through its decentralized, immutable ledger systems, which are capable of fully transforming how financial transactions are recorded, validated, and reported (Prokopenko *et al.*, 2024; Dai & Vasarhelyi, 2017; Schmitz & Leoni, 2019).

Background of the study

In the current age of digital transformation, trustworthiness and dependability of financial data are critical for decision-making by investors, regulators, and other stakeholders. Financial reports are not only a statement of an organization's position but also its accountability to the public through its transparency and accuracy. However, traditional financial accounting systems are centralized and easy to manipulate the financial data and no real time visibility. These realities hinder public trust and make it almost impossible to confirm and validate integrity in financial governance, especially in developing countries such as Bangladesh in the public sector.

The global evolution of financial technology (FinTech) has introduced new tools which are designed to address a number of shortcomings. Among these developments, blockchain technology is one of the most revolutionary innovations, providing a decentralized and permanent system for recording, verifying, and sharing data. Blockchain ensures that every financial transaction is recorded on a distributed ledger that is shared by all authorized parties and cannot be altered by any unauthorized person to prevent fraud (as well as tampering with data). This is particularly helpful because of the transparency, traceability, and security features of the blockchain, which make it a powerful tool to improve financial reporting and auditing processes (Dai & Vasarhelyi, 2017; Schmitz & Leoni, 2019).

In Bangladesh, financial institutions, and public sector organizations have begun examining blockchain-based solutions, particularly in trade finance, import-export operations, and remittance processing. For example, the adoption of blockchain-based technology by Bank Asia PLC has shown to have a positive impact through an increase in total imports, total exports, and remittance inflows. In addition, Prime Bank PLC also experienced growth in loans and advances as a result of blockchain adoption. These results suggest that blockchain has the capacity to enhance operational efficiency and improve the transparency of financial transactions in the national financial system.

But, the public sector in Bangladesh still faces many challenges that interrupt to utilize blockchain technology competently. Challenges including inadequate technological infrastructure, an lack of skilled human capital, management resistance, and limited investment will present a challenge. For these specific limitations, a complete framework is required to integrate blockchain technology with data science, distributed ledger systems, and cloud computing, to facilitate accurate, reliable, and real time data traceability. First, this study will investigate how blockchain technology can be. The study will analyze existing practices in selected financial institutions, and propose a practical blockchain based financial reporting framework incorporated into the public financial reporting system of Bangladesh to develop transparency, mitigate data manipulation, and improve stakeholder confidence.

Research Objectives

This study endeavors to

1) Analyze The current scenario of blockchain technology in the selective financial institutions of Bangladesh.

2) Develop a Proper framework to ensure financial reporting accountability using blockchain technology in other public sectors

Scope of the study

This study delves into finding out the current scenario of blockchain technology in the financial sector of Bangladesh and its pros and cons and to develop a proper frame work for the adoption of blockchain technology into public sector of Bangladesh to ensure accountability and transparency to the stakeholders. It can connect the collaboration of administration, ministry, law enforcement department & other assigned departments under a same umbrella. Additionally, this study may also help out other sub continental countries like India, Sri Lanka or other countries facing same kinds of challenges & desiring solution to ensure data transparency, data traceability, and accountability towards stake holders (Sarker *et al.*, 2025).

MATERIALS AND METHODS

Research Design

The evolution of blockchain technology in financial accounting was investigated in this study using a mixed-methods approach that combined qualitative and quantitative assessments. Through the combination of theoretical concepts and empirical data, the mixed-methods methodology guaranteed a thorough comprehension. The study was divided into two major stages: (1) developing the theoretical framework by conducting a thorough literature review; and (2) using a combination of qualitative thematic analysis and quantitative statistical evaluation to examine real-world blockchain implementation examples across a range of

industries (Prokopenko *et al*., 2024)

Theoretical Framework

In order to improve the study's structure, blockchain's role in industry finding were essential. Blockchain affects stakeholders' engagement and sustainable financial practices (Blanco-González-Tejero *et al*., 2024). They also highlighted how blockchain can promote trust and transparency, two important aspects of its integration into financial accounting. The study's methodological approach was organized under this framework, which concentrated on how blockchain affects financial accounting compliance, efficiency, and transparency. Our study, however, intends to develop a proper framework for those stake holders who are actively involved in public sectors in Bangladesh which will further lead to ensure data transparency, data traceability and accountability against misappropriation of data.

Qualitative Analysis

Qualitative Measures: In data collection process, qualitative data will be collected & interpreted from different sources, for examples- various journals, books, business magazines, internet etc (Sarker *et al.* 2025).

Quantitative Analysis:

Financial data related to blockchain adaptation was quantify quantitatively using statistical methods. The techniques used to understand the study were the following: (1) Descriptive statistics: compiled performance indicators before and after blockchain integration, including transaction speeds, cost savings, and error rates. (2) correlation models were used in inferential research to evaluate how blockchain adoption affected important financial metrics like audit efficiency and compliance rates.

The financial data related to blockchain deployments was also subjected to quantitative examination utilizing statistical approaches. Three main sources of data were used in the study: financial statements, business reports, and industry benchmarking.

Ethical Considerations:

Ensuring proper citation and data transparency throughout the research process were among the ethical considerations. As the study used secondary data in order to preserve the validity and integrity of the results, confidentiality and appropriate data handling were given top priority. To protect privacy, all sources are appropriately referenced (Prokopenko *et al*., 2024).

LITERATURE REVIEW

There is increasing interest in examining the advantages, challenges, and consequences of blockchain technology for accounting and auditing procedures, as evidenced by the financial accounting literature on the subject. A thorough analysis of the literature on earnings management can examine the implications for regulatory supervision and standard-setting (Healy *et al*., 1999). The cost of audit failure can affect the financial reporting's reputation and credibility (Chaney *et al*., 2002). In our study, we want to present how blockchain ensures data transparency in the financial reporting and enhances the reliability of those reports. The idea of triple entry accounting proposes a novel framework for utilizing blockchain technology to document financial transactions (Grigg, 2005). Triple entry accounting is like a double entry accounting but with a secure third record. It is a record of a transaction cryptographically sealed to a shared distributed ledger, such as a blockchain. This third entry serves as immutable proof that there is an agreement about the transaction between the parties involved. In our study we want to show that how this third party called blockchain helps to prevent fraud, make audits easier, and make the keeping of financial records more transparent and reliable. The expanding significance of intangible assets in accounting and business research provides background information to understand how financial accounting is changing (Basu *et al*.,2008). A peer-to-peer electronic cash system establishes the groundwork for blockchain technology, providing the groundbreaking white paper on Bitcoin (Prokopenko *et al*., 2024; Nakamoto, 2008).

The foundation for blockchain's function in automating financial transactions and contracts presents the idea of smart contracts and decentralized apps (Buterin, 2014). A role refinement in access control can address the issues with data security and privacy in distributed computing systems (Mookerjee *et al*., 2014). Our study will propose a framework to present how this role refinement access control increases the integrity of the process.

Big data in accounting has the ability to completely transform financial reporting, data analytics, and decision-making (Vasarhelyi *et al*., 2015). A vast amount of data can enhance the credibility of the financial conditions. In our study, we proposed a framework how this vast amount of data can be protected through blockchain technology to ensure data transparency and data traceability. Audit errors affect the insights about the partners' reputations and stakeholder views(Rui *et al*., 2016). The revolutionary potential of blockchain technology might change the economy by improving data management and transaction efficiency, security, and transparency (Warburg, 2016). Our study will propose how this technology can increase the financial reporting transparency into public sector accounting of Bangladesh.

The potential of blockchain technology for accounting applications can affect financial reporting and audit procedures (McMickle *et al*., 2017). A distributed control system on blockchain might be used to improve data security and integrity in decentralized computing settings (Stanciu, 2017). Our study will find out how decentralized computing system can enhance the transparency of the public sector accounting. Blockchain technology enhance accountability, transparency, and shareholder rights on corporate governance (Yermack, 2017). In our study we will propose a framework to reduce the corruption in the public sector accounting of Bangladesh.

Blockchain technology in financial accounting can

improve audit trails, lower fraud risks, and increase the accuracy and transparency of financial reporting (Yu *et al*., 2018). Blockchain technology enhance the efficiency and reducing transaction costs (Semerl, 2018).

A beginner's guide to blockchains and bitcoins is given by Lewis, 2018 who also introduces the underlying technology that powers cryptocurrencies. The potential of FinTech and IoT to generate credit through mobility highlights the revolutionizing financial services and increasing credit availability (Prokopenko *et al*., 2024; Nakashima, 2018). The idea of auditing blockchain-based smart contracts can improve transparency and automate audit procedures (Prokopenko *et al*., 2024; Rozario *et al*., 2018). Blockchain's potential can boost productivity and lower transaction costs in international trade procedures (Semerl, 2018).

Blockchain technology significant research and development (Patil & Puranik, 2019). Analysis of blockchain can increase efficiency and transparency on accounting and auditing (Bonson & Bednorov, 2019). Blockchain technology is changing business models and emphasizes its ability to disrupt conventional company procedures and improve operational effectiveness (Chowdhury, 2019).

The potentiality of blockchain technology improves supply chain management and logistics operations' transparency. (Deloitte, 2019. Auditor benchmarking of client disclosures provide insight into the function of auditors in evaluating the caliber and dependability of financial data (Prokopenko *et al*., 2024; Drake *et al*., 2019). Blockchain's has significant effects on audit procedures and guarantee data integrity (Bonyuet, 2020). The use of blockchain in audit procedures might improve accountability and transparency (Cheng & Huang, 2019). Blockchain revolutionize risk management procedures in businesses (Ilbiz, 2020).

The integration of blockchain technology with accounting information systems may improve the security, efficiency, and transparency of accounting procedures (Fullana and Ruiz, 2021). Distributed ledger technologies, such as blockchain, interact with accounting procedures in order to looking at how accounting is changing in the digital age (Gietzmann and Grossetti, 2021).

IOT (Internet of Things) refers a network of physical objects that are connected to the internet & can exchange data with other devices & system (Sarker *et al*., 2025; Ping *et al*., 2018). In our study, we endeavor to explore how IOT will help us to work on developing proper financial reporting with decentralized ledger with controlled network.

Collectively, these studies enhance our knowledge of the potential, obstacles, and uses of blockchain technology in corporate governance, accounting, and financial reporting. They emphasize how blockchain technology has the power to revolutionize conventional methods, boost productivity, and promote transparency and credibility in corporate dealings.

RESULT AND DISCUSSION

Current scenario of Blockchain Technology in Bangladesh

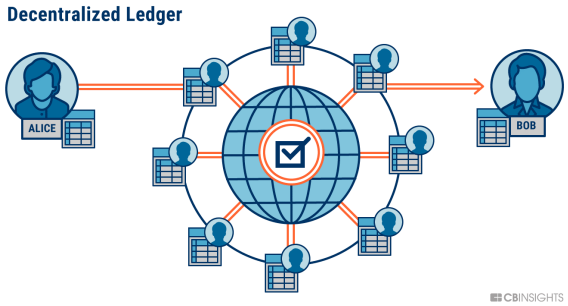
Blockchain was created in 2008 by Satoshi Nakamoto to act as the public ledger of transactions pertaining to bitcoin, the first digital currency to address the issue of double-spending without the need for a central server or reliable authority. The decentralization mechanism known as "blockchain" allows all parties to see the whole database and validate all records without the need for a mediator or single-party control. A novel approach to data security is blockchain technology.

Mulligan (2016) conceptualizes blockchain in the following manner: A blockchain allows untrusting parties with common interests to co-create a permanent, unchangeable and transparent record of exchange and processing without relying on a central authority.

In fact, each block of a blockchain that develops gradually with time due to transaction among participating parties of the network, consists of two basic elements: header. it contains the unique reference number, timestamp of block generation and connection to previous block, and contents. it contains information about sender, receiver and transacted amount or exchanged information for future records (Deloitte, 2015). The whole technology works on two premium digital ideas: asymmetrical cryptography. In this encryption technology data are encrypted and decrypted with two separate keys known as public key and private key, and distributed computer network. it is a decentralized IT network, where the actors are interconnected with computers and permissioned to access, transfer and monitor data independently without any interruption of third parties (PwC, 2015).

A blockchain is made up of three essential components: distributed ledger technology, immutable records, and smart contracts. The way a blockchain operates is that every transaction is recorded as a "block" of data, and each block is linked to the ones that came before and after it. These transactions are then blocked together in an irreversible chain, known as a blockchain.

To prevent fraud to financial transactions and the privacy of the parties blockchain involves in the process. Blockchain technology uses data encryptions and



decryptions methods to utilize the public and private keys into the process of transactions. There is no chance to alter the keys or blocks that have already been generated, it is nearly impossible for financial miscreants to carry out any fraudulent transactions. Moreover, it is possible to verify the transactions or data at any time by using the blockchain technology, which assists in identifying any illicit transactions.

Even though the technology's global application is still in its infancy, the biggest institutions and nations in the world are closely monitoring its advancement. It is utilized for trade finance, digital currency deposits, intrabank operations, interbank or cross-border payments, cryptocurrency payments, and the coordinated and decentralized completion of all banking services. One bank can transfer funds to another cross-border bank without the need for a third party, such as a SWIFT code, because financial transactions do not require intermediaries.

North Korean hackers took $81 million from Bangladesh Bank in 2016. It is the biggest cyber heist to date, known as 'the Lazarus robbery.' The funds were taken from the Bangladesh Bank account at the Federal Reserve Bank in New York. To transfer big sums of money between banks, the hackers gained access to SWIFT, which was a startling feature of the historic heist.

Blockchain technology is a reliable digital transaction mechanism based on the internet protocol. This emerging technology has the potential to revolutionize the financial transaction system in a number of areas that are currently providing by the banking sector of Bangladesh. Standard Chartered Bank, Prime Bank, HSBC Bank, and bKash are among the financial organizations in Bangladesh that have begun implementing blockchain technology thus far. Krishi Swapno is one of the Agro-Tech firms that have used the technology as a pilot project.

Since 2020, Bkash implemented blockchain technology to make it easier for Malaysians to send money overseas. In order to establish this remittance corridor between the two nations, bKash teamed up with Mobile Money, a Malaysian mobile wallet company, and Ripple, a blockchain-based global payment solution provider, to permit wallet-to-wallet payments. bKash's has facilitated remittance services and ensured decentralized structure, improved security and privacy, Tokenization (Security Feature), Speed (Real-time update), and Visibility and traceability.

According to Prime Bank, it was the first bank in Bangladesh to complete an interbank blockchain LC transaction with HSBC bank in December 2020. In order to complete the pilot transaction, Prime Bank opened an inland LC on behalf of Ananta Group using Contour, a global blockchain network. The purpose of this transaction was to import raw materials from HSBC Bangladesh's client Tamishna Group. Through Contour's network, the whole process of pre-negotiation, creating, and approving LCs by importer and beneficiary, as well as issuing LCs and presenting papers, was completed digitally. There was no documentation involved in the transaction, and there was no need to visit banks in person. Instead, in order to complete any task, purchasers, banks, and beneficiaries all had to connect into Contour's network.

In August 2020, Standard Chartered Bank processed a blockchain transaction by issuing an LC for Viyellatex Ltd, an RMG company in Bangladesh, acting as the issuing bank for the applicant. Additionally, Contour was used for this transaction.

The first bank in Bangladesh to perform a cross-border blockchain transaction was HSBC. Using blockchain technology, HSBC bank established a cross-border loan for United Mymensingh Power Limited to import 20,000 tons of gasoline from Singapore. Because to the new technology, opening an LC now took less than 24 hours, compared to five to ten days in the past.

In collaboration with RAKBank of the United Arab Emirates, Bank Asia Ltd., a regional commercial bank in Bangladesh, has implemented a blockchain remittance transfer system. The blockchain technology was transferred by RAKBank from its own remittance transfer platform, which was created by Ripple. To make it easier for wage earners to transfer money home, RAKBank has also deployed the same blockchain technology in other nations, such the Philippines. As a thoughtful choice to add the newest blockchain technology to the RAK Money movement system, Ripple, a longtime technological partner of Bank Asia, creates the RippleNet for the instant movement of funds to the partner bank (Saha, k, 2021).

Interpretation: Blockchain adoption increases the amount of the total import of Bank Asia PLC by 42649.7 million (BDT). The value of R i.e. 0.404136 indicates that there

Table 1: DID Import Model of Bank Asia PLC

Year	Status (Blockchain Adoption)	Million (BDT)	$\bar{X}$	DID in Million (BDT)	Co Variance	R
2024	After	206,883	197984.4	42649.7	4.886824547×10^{8}	0.404136
2023	After	205,373				
2022	After	210,588				
2021	After	225789				
2020	After	141289				
2019	Before	158115	155334.7			
2018	Before	165203				

2017	Before	225789				
2016	Before	116828.59				
2015	Before	110738				

is a positive relation between blockchain adoption and amount of imported revenue of Bank Asia PLC.
Interpretation: Blockchain adoption increases the amount of the total export of Bank Asia PLC by 31357 million (BDT). The value of R i.e. 0.820 indicates that

Table 2: DID Export Model osf Bank Asia PLC

Year	Status (Blockchain Adoption)	Million (BDT)	$\bar{X}$	DID in Million (BDT)	Co Variance	R
2024	After	146626	143694	31357	5.043668346×10^{8}	0.820
2023	After	150524				
2022	After	171275				
2021	After	141496				
2020	After	108549				
2019	Before	132465	112337			
2018	Before	136733				
2017	Before	141496				
2016	Before	79021.96				
2015	Before	71969				

there is a positive relation between blockchain adoption and amount of exported revenue of Bank Asia PLC
Interpretation: Blockchain adoption increases the amount of the total Remittance Inward of Bank Asia PLC by 71668.29 million (BDT). The value of R i.e.

Table 3: DID Remittance Inward Model of Bank Asia PLC

Year	Status (Blockchain Adoption)	Million (BDT)	$\bar{X}$	DID in Million (BDT)	Co Variance	R
2024	After	125306	114204.8	71668.29	1.486724664×10^{8}	0.42977
2023	After	86123				
2022	After	132243				
2021	After	128441				
2020	After	98911				
2019	Before	79750	42536			
2018	Before	27528				
2017	Before	37980				
2016	Before	33090.566				
2015	Before	34334				

0.42977 indicates that there is a positive relation between blockchain adoption and amount of Remittance Inward of Bank Asia PLC. Interpretation: Blockchain adoption increases the amount of the total Loans & Advances of Prime Bank PLC by 125744.4 million (BDT). The value

Table 4: DID Loans & Advances for Prime Bank PLC

Year	Status (Blockchain Adoption)	Million (BDT)	$\bar{X}$	DID in Million (BDT)	Co Variance	R
2024	After	343458	283653.2	125744.4	3.507679614×10^{8}	0.42800
2023	After	315293				
2022	After	296481				
2021	After	249829.58				

2020	After	213,204.60				
2019	Before	188945.47	157908.8			
2018	Before	156960				
2017	Before	135891				
2016	Before	148123.714				
2015	Before	159624.87				

of R i.e. 0.42800 indicates that there is a positive relation between blockchain adoption and number of Loans & Advances of Prime Bank PLC.

Developing a Proper framework to ensure financial reporting accountability using blockchain technology in other public sectors

Table 5: Bkash remittance:

year	crore
2023	4652
2022	2427
2021	2343
2020	1151

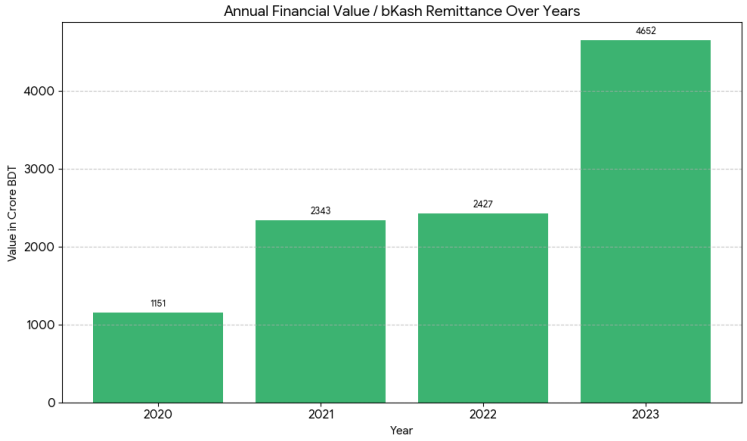


Figure 1: Annual Financial Value of Bkash Remittance over years

In Bangladesh, public sector accounting (PSA) pertains to governmental and nonprofit entities' formal financial recording and reporting (Sarkar, 2019). Accounting and financial reporting of Bangladesh's public sectors has faced many challenges due to lack of transparency, Delays, potential fraud, inaccurate reporting, lack of accountability, inability to show true cost. etc. Cash based system is still criticized for the misleading and failed to account for the full cost of government activities. Financial Reporting Act 2015 (FRA 2015) had imposed to improve the accountability and transparency of the financial reporting procedures in the country on September 6, 2015. International Public Sector Accounting Standards (IPSAS) aims to improve the quality of general-purpose financial reporting by public sector entities, in order to provide more informed evaluations of government resource allocation choices, which will increase accountability and transparency. The Bangladesh Financial Reporting Framework (FRF), governed by the government of Bangladesh, necessitates audited annual finance accounts and appropriation accounts or statements (Islam, 2020; Islam, 2017).

The Current reporting system or procedure of Bangladesh's Public sector Accounting has some major criticisms. Like, lack of transparency, Delays, potential fraud, inaccurate reporting, lack of accountability, inability to show true cost.

Tendency for delays in financial reporting undermines timely decision-making. There is a heightened risk of misrepresentation and potential manipulation of financial data. Such inconsistency between financial transactions and their accounting could mask the real financial condition of public institutions and lead to various forms of inefficiency, including fraud.

The Office of the Comptroller and Auditor General (OCAG) has faced its share of criticisms regarding the impenetrability of the financial reports it puts out. This disintegrates public accountability and collapsed trust in government financial management. The lack of transparency in reporting has led to stakeholders such as

policymakers, oversight bodies, and the public not being able to analyze in a proper way how the public money is spent, and if the spending is in line with the policy priorities or not.

Transparency International Bangladesh (TIB) reports that the financial reporting of the public sector in Bangladesh is marred by large-scale corruption and a huge transparency gap. The U.S. Department of State, in its Fiscal 2025 Transparency Report, accused Bangladesh of being non-compliant with the minimum requirements of fiscal transparency and pointed out that the government had no proper revenue and expenditure reporting. A national household survey conducted by the Transparency International Bangladesh for 2023-2024 showed that more than 70% of households faced corruption in the process of availing public and private services. Bribes worth an estimated BDT 10,902 crore (approx. $1.43 billion) were paid in 2023 alone.

The Anti-Corruption Commission (ACC) has filed the case for allegedly causing a loss of Tk322 crore to the government through misappropriation, forgery, and various other irregularities. The case statement reads that the accused individuals, in conspiracy with each other, abused their authority and committed criminal breach of trust, fraud, and forgery with an intent to benefit themselves and others by altering the purchase contract and tender specifications relating to the procurement of 10 meter-gauge (MG) diesel-electric locomotive engines. They accepted substandard engines without any PSI and even though the engines failed to meet the contractual conditions, they fraudulently certified those engines as compliant with the conditions of the purchase order. In this way, they embezzled over Tk1.36 crore and caused a loss of Tk322.68 crore to the government (The Business Standard, 2025).

According to a report by Prothom Alo, national flag carrier Biman Bangladesh Airlines earned a profit of Tk 286.5 million in the 2022-23 fiscal year. But questions have arisen whether this national flag flier is actually making a profit or displaying a profit by juggling figures. Large debts are not being showed in it's financial statements. Corruption in different sectors of the Biman Bangladesh Airlines is another significant barrier that is making it difficult for the organisation to break away from loss making ways. Incidents of corruption are evident in purchase and leasing of aircraft, store and purchase of spare parts, in the tender process and in ticketing and reconfirmation. The Anti-Corruption Commission (ACC) chairman has noted that 70-80% of corruption in government institutions is linked to procurement, a process where limited information is typically disclosed. These scenarios indicate that corruption and lack of transparency remain pervasive issues across Bangladesh's public sector, despite efforts by the current interim government to address them.

Step by Step Progression

1. Setting up data input point at every office (District Level Office, Regional Head Office (If any)

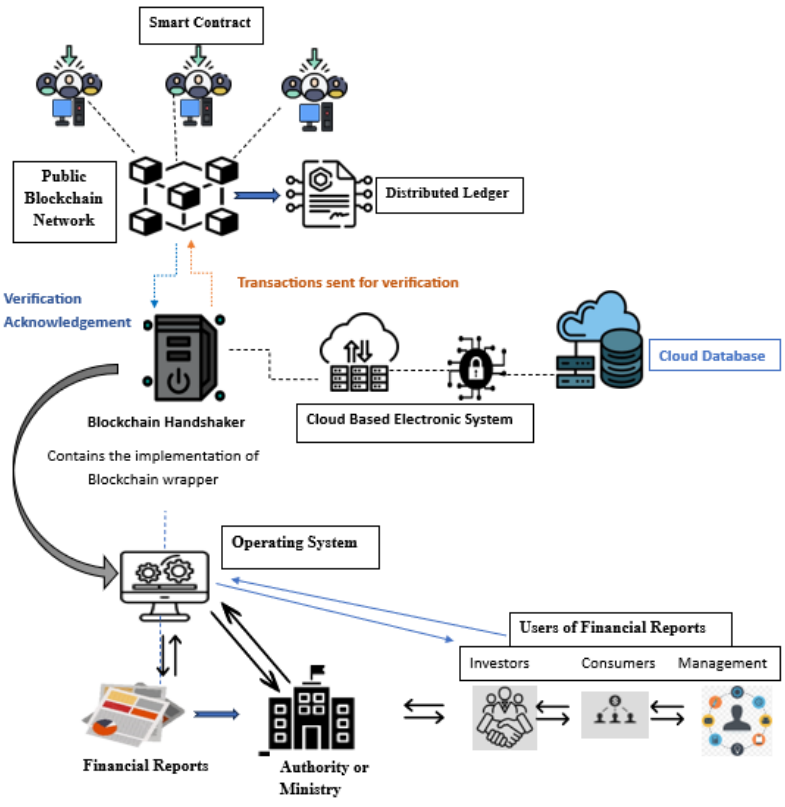


Figure 2: How blockchain technology contributes for financial reports' transparency

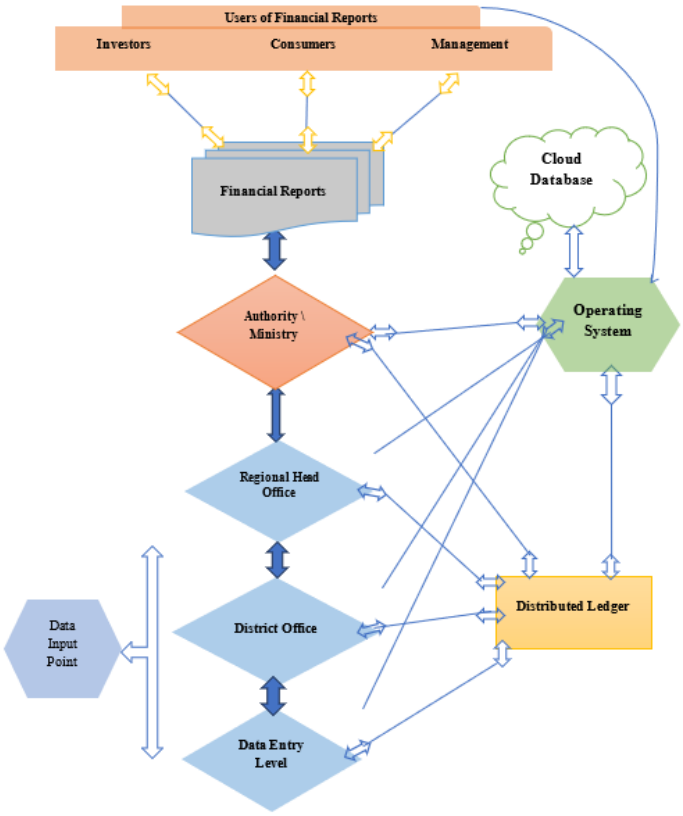


Figure 3: A proposed framework for financial reports using blockchain technology

2. In entry level, the information of end users including their usages, feedbacks should be Incorporated with a view to connecting distributed ledger.
3. Then, the district office will analyze that collected data and subsequently reconciliate, adjust (if needed) and finally provide overall report using operating system and connecting distributed ledger as well to the regional head office so that authority can easily perceive the pros and cons for better comprehensiveness connected to the distributed ledger.
4. Then, regional head office will delve into all reports collected from various district levels and make necessary initiatives (if needed) and send back to authority or ministry level as the part of decision-making process giving the proper analysis and recommendations.
5. Finally, authority or ministry collects all sorts of report from various levels and then examine, analyze the reports on the basis of which, various statistical analysis such as co-variance, co-relation, regression, SWOT analysis should have been made. Moreover, recommendations coming out from various field level must be taken under consideration. Besides, responding to the whistle blowers, or window-dressing should be handled with topnotch responsibilities. Collaborating with all departments, decision must be made on budgetary planning, service module development, providing authentic financial reports and reducing corruptions, ensuring transparency and real time data traceability. As a whole, authority will endeavor to provide the authentic, reliable and transparent financial reports to its stakeholders on time.

Challenges of the study

1. To ensure infrastructure development of blockchain technology.
2. Lack of technologically skilled persons.
3. Lack of proper willingness of authority due to proper integrity, honesty and ethical considerations.
4. Lack of proper attitude to embrace new technological innovation.
5. Budgetary constraints to respond technological innovation.
6. Reluctancy to research and development.
7. Lack of proper initiatives to make graduate students technologically sound.
8. Institutions can't play significant roles to respond current world regarding technological innovations.

CONCLUSION

The results of this study identify how blockchain technology could be impactful in the enhancement of better financial reporting systems in Bangladesh's public sector. Transparent, immutable, and traceable data can help in fraud mitigation, decreasing human mistakes and ensuring public trust on the financial information. Empirical evidence from this study indicates that blockchain adoption positively influences various financial operations, such as import, export, remittance, and lending activities. The integration of

blockchain promises greater operational efficiency and more accurate financial reporting by enhancing good governance and accountability. The proposed framework demonstrates how a well-structured blockchain-based financial reporting system can link all participants i.e. data providers, management, analysts, ministry, auditors and policymakers through a secured and decentralized network. This integration of blockchain to the operating system minimizes the risk of window dressing and unauthorized data modification and manipulation. And enabling users to have the real-time access to verified financial information.

The study perceives that adoption of blockchain requires huge investments in technologies, human capacity, and institutional commitment. The blockchain, in short, does not just represent a digital innovation; it's also a strategic governance tool that has the ability to reshape the financial accountability landscape in Bangladesh. Once well-integrated with data science, it also has the potential of building transparency and trust with efficiency-hallmarks for sustainability in financial management within the digital era.

The following recommendations are based on the findings and analysis of this research in the implementation of blockchain technology in public sector financial reporting systems for policymakers, regulators, and financial institutions.

1. Develop technological infrastructure.
2. Government should invest in high-speed network, data centers, cloud-based storage system to support distributed ledger operation.
3. Focus on Skill development programs to enhance the technical skill of professionals.
4. Restructure the regulatory framework to ensure data security.
5. Continuous Monitoring and Evaluation needs to maintain accountability, transparency and continuous improvement.

REFERENCES

Atlam, H., Alenezi, A., Alassafi, M. O., & Wills, G. (2018). Blockchain with internet of things: Benefits, challenges, and future directions. *International Journal of Intelligent Systems and Applications, 10*(6), 40-48. DOI: https://doi.org/10.5815/ijisa.2018.06.05

Basu, S., & Waymire, G. (2008). Has the importance of intangibles really grown? And if so, why? *Accounting and Business Research, 38,* 171–190. DOI: https://doi.org/10.1080/00014788.2008.9663331

Blanco-González-Tejero, C., Cano-Marin, E., Ulrich, K., & Giralt-Escobar, S. (2024). Leveraging blockchain for industry funding: A social media analysis. *Sustainable Technology and Entrepreneurship*, 3, 100071.

Bonyuet, D. (2020). Overview and impact of blockchain on auditing. *International Journal of Digital Accounting Research, 20,* 31–43. DOI: https://doi.org/10.4192/1577-8517-v20_2

Buterin, V. (2014). A next-generation smart contract and decentralized application platform, White Paper, 3, 1–36. URL: https://ethereum.org/en/whitepaper

Cai, C. W. (2021). Triple entry accounting with blockchain: How far have we come? *Accounting and Finance, 61*(2), 71-93. DOI:https://doi.org/10.1111/acfi.12556?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Dart icle

Cernea, M. S., Ene, O. C. B., Monac, & C. M., VrÃ. (2022). The perspective of the implementation of the blockchain within Romanian companies. *Social Economic, 11,* 20–25. DOI: https://dx.doi.org/10.2139/ssrn.5082605

Chaney, P.K., & Philipich, K.L. (2002). Shredded reputation: The cost of audit failure. *Journal of Accounting Research, 40,* 1221–1245. DOI: https://doi.org/10.1111/1475-679X.00087?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle

Cheng, C., & Huang, Q. (2019). Exploration on the application of blockchain audit. In Proceedings of the 5th International Conference on Economics, Management, Law and Education (EMLE 2019), Krasnodar, Russia.11–12, 110, 63-68. DOI: https://doi.org/10.2991/aebmr.k.191225.012

CPA Journal. (2020). Blockchain technology and the future of accounting. *The CPA Journal, 90*(6), 16–21.

Dai, J. & Vasarhelyi, M. A. (2017). Toward blockchain-based accounting and assurance. *Journal of Information Systems, 31*(3), 5–21. DOI: https://doi.org/10.2308/isys-51804

Fullana, O. & Ruiz, J. (2021). Accounting information systems in the blockchain era. *International Journal of Intellectual Property Management, 11*(1), 63–80. DOI: https://doi.org/10.1504/IJIPM.2021.113357

Gapurbaeva, S., Umetaliev, A., Orozonova, A.,Zinchenko, A.,Ovcharenko, T., & Huliaieva, L. (2023). The Impact of Cryptocurrency on the Investment Market. *Review of Ecoomic Finance, 21,* 647–652. DOI: https://doi.org/10.55365/1923.x2023.21.68

Grigg, I. (2005). *Triple Entry Accounting. Systemics*, Incorporation, DOI:https://doi.org/10.13140/RG.2.2.12032.43524

Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons, 13* (4): 365–383. https://doi.org/10.2308/acch.1999.13.4.365

Horngren, C. T., Sundem, G. L., Elliott, J. A., & Philbrick, D. R. (2013). *Introduction to financial accounting* (11th edition.). Pearson.

Ilbiz, E. (2020). Blockchain: A new disruptive innovation for knowledge risk management. In book: *Knowledge Risk Management* (pp.119-132). DOI: https://doi.org/10.1007/978-3-030-35121-2_8

Islam, M. S. (2020). Public Financial Management (PFM) in Bangladesh. *The Cost and Management, ISSN 1817-5090, 48* (5), 24-38. DOI: https://icmab.gov.bd/wp-content/uploads/2020/11/3.Public.pdf

Saha, K. K. 2021. *An Analysis of Adoption of Blockchain Technology in the Private Banking Sector of Bangladesh.*

BRAC Institute of Governance and Development. http://hdl.handle.net/10361/14883

Kokina, J., & Davenport, T. H. (2017). The emergence of artificial intelligence: How automation is changing auditing. *Journal of Emerging Technologies in Accounting, 14*(1), 115–122. DOI: https://doi.org/10.2308/jeta-51730

Koldovskyi, A. Corporate social responsibility audit: Theoretical aspects. (2015). *Risk Governance and Control: Financial Markets & Institutions, 5*(3), 135–144. DOI: https://doi.org/10.22495/rgcv5i3c1art5

Kuddus, M. A., Sarkar, A., & Rohoman, M. M. (2019). Financial Administration and Governmental Accounting Systems in Bangladesh: An Analysis. *International Journal of Science and Research (IJSR), 8*(1), 1879- 1883. DOI: https://dx.doi.org/10.21275/ART20194716

Moll, J., & Yigitbasioglu, O. (2019). The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. *The British Accounting Review, 51*(6), 100833. DOI: https://doi.org/10.1016/j.bar.2019.04.002

Monrat, A.A., Schelén, O. (2019). Andersson, K. A survey of blockchain from the perspectives of applications, challenges, and opportunities, *IEEE Access, 7*, 117134–117151. DOI: https://doi.org/10.1109/ACCESS.2019.2936094

Nakamoto, S. (2008). A Peer-to-Peer Electronic Cash System. *Decentralized Business Review*, 21260. http://dx.doi.org/10.2139/ssrn.3440802

Needles, B. E., Powers, M., & Crosson, S. V. (2014). *Financial and Managerial Accounting* (10th ed.). Cengage Learning.

Sarker, P., Sarker, C., & Huq, K. (2025). Integration of Data Science and Block Chain to Secure Food Safety in Bangladesh. (2025). *American Journal of Food Science and Technology, 4*(1), 90-98. DOI: https://doi.org/10.54536/ajfst.v4i1.4787

Prokopenko, O., Koldovskiy, A., Khalilova, M., Orazbayeva, A., & Machado, J. (2024). *Development of Blockchain Technology in Financial Accounting, Computation, 12*(12). 250. DOI: https://doi.org/10.3390/computation12120250

Prokopenko, O., Zholamanova, M., Mazurenko, V., Kozlianchenko, O., & Muravskyi, O. (2022). Improving customer relations in the banking sector of Ukraine through the development of priority digital banking products and services: *Evidence from Poland, Banks and Bank Systems, 17*,(3), 12–26.DOI: https://dx.doi.org/10.21511/bbs.17(3).2022.02

Rozario, A. M., & Thomas, C. (2019). Reengineering the audit with blockchain and smart contracts. *Journal of Emerging Technologies in Accounting, 16*(1), 21–35. DOI: https://doi.org/10.2308/jeta-52432

Sarker, P. (2021). Challenges faced by entrepreneurs in the agricultural sector of Bangladesh. *IOSR Journal of Business and Management, 22*(8), 13–26. DOI: https://doi.org/10.9790/487X-2208031326

Schmitz, J., & Leoni, G. (2019). Accounting and auditing at the time of blockchain technology: A research agenda. *Australian Accounting Review, 29*(2), 331–342. DOI: https://doi.org/10.1111/auar.12286

Shafranova, K., Navolska, N., & Koldovskyi, (2024). A. Navigating the digital frontier: A comparative examination of Central Bank Digital Currency (CBDC) and the Quantum Financial System (QFS). *SocioEconomic Challenges, 8*(1), 90–111. DOI: https://doi.org/10.611093/sec.8(1).90-111.2024

Stanciu, A. (2017). Blockchain based distributed control system for edge computing. *In Proceedings of the 21st International Conference on Control Systems and Computer Science (CSCS)*, Bucharest, Romania, 29–31May 2017; pp. 667–671. DOI: https://doi.org/10.1109/CSCS.2017.102

Vasarhelyi, M.A.; Kogan, A., & Tuttle, B.M. (2015). Big data in accounting: An overview. *Accounting Horizones, 29*(2), 381–396. DOI: https://doi.org/10.2308/acch-51071

Wang, J., & Wang, D. (2022). Corporate Fraud and Accounting Firm Involvement: Evidence from China. (2022). *Journal of Risk and Financial Management, 15*(4), 180. DOI: https://doi.org/10.3390/jrfm15040180

Xia, H., Dawande, M., & Mookerjee, V. (2014). Role refinement in access control: Model and analysis.,*INFORMS Journal of Computing, 26,* 866–884. DOI: https://doi.org/10.1287/ijoc.2014.0603

Yermack, D. (2017). Corporate governance and blockchains. *Review of Finance, 21*(1), 7–31. DOI: https://doi.org/10.1093/rof/rfw074

Yu, T., Lin, Z., & Tang, Q. (2018). Blockchain: The introduction and its application in financial accounting. *The Journal of Corporate Accounting & Finance, 29,* 37–47. DOI: https://doi.org/10.1002/jcaf.22365

Appendix

Figure 1: Annual Financial Value of Bkash Remittance over years

Figure 2: How blockchain technology contributes for financial reports' transparency

Figure 3: A proposed framework for financial reports using blockchain technology

DID (Difference In Difference) = (Mean of change adopter – mean of change non adopter)

= Change adopter (sum of total amount / total years) – Change non adopter (sum of total amount / total years)

Standard Deviation	$s = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n-1}}$
Sample covariance	$Cov(X,Y) = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{n-1}$
Correlation	$\rho_{XY} = \frac{Cov(X,Y)}{\sigma_x \sigma_y}$