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Blockchain Beyond Cryptocurrencies: A Study on Its Impact on Corporate Governance Practices

Shilpi Sahi and Roopa Johri***

ABSTRACT

The world is being revolutionized by technological breakthroughs worldwide, and Blockchain technology is a formidable innovation expanding beyond its original development as a technology for bitcoins. This paper examines how Blockchain technology can contribute to better corporate governance across a range of issues, including transparency, agency costs, and shareholder voting. The study comprehensively explores Blockchain's underlying principles, its myriad applications in various industries, and its potential impact on corporate governance, drawing on a wide-ranging survey of existing literature and published reports. Drawing on extensive qualitative analyses of relevant literature and published reports, the study provides a broad overview of Blockchain's fundamentals, its many use cases across the domains, and its prospects for corporate governance. A case study of four significant businesses using blockchain technology is included in the research to examine how this technology might be incorporated into corporate governance frameworks. The findings show that employing blockchain technology can improve transparency and lower the agency's transaction costs. Additionally, the duties related to shareholder voting will be reinforced to guarantee honesty and equitable operations.

Keywords: *Corporate Governance; Blockchain; Agency Costs; Transparency.*

1.0 Introduction

This paper tends to examine the implications of blockchain technology for corporate governance practices. Blockchain enabled crypto currencies such as Bitcoins are

**Corresponding author; Assistant Professor, Department of Commerce, Bharati College, University of Delhi, Delhi, India (E-mail: shilpysahi@gmail.com)*
***Associate Professor, Department of Commerce, Bharati College, University of Delhi, Delhi, India (E-mail: roopa.johri@bharati.du.ac.in)*

more popular but this technology can be extensively useful for other sectors (Murray *et al.*, 2019). Blockchain technology can be a disruptive tool to improve processes and efficiency in several industries (Michelman, 2017; Tapscott & Tapscott, 2017). Blockchain is a disruptive technology that has introduced a completely new organizational structure known as the decentralized autonomous organization (DAO). A DAO operates entirely through protocols encoded and executed by smart contracts, eliminating the need for human intervention (Murray *et al.*, 2019). These advancements suggest that blockchain has the capability to revolutionize transaction processes, lower costs linked to agent-managers and potentially reshape the governance models of certain organizations.

2.0 Objectives

To examine the implications of blockchain technology on corporate governance practices is main highlight of this paper. Blockchain technology is discussed in the light of existing practices of commerce on the internet. Usage of blockchain technology and its implications is discussed specifically in corporate governance. Recently nations including India, are making efforts to build digital platforms using blockchains. Keeping this in mind following are the objectives of this paper:

- Understand scope and need of blockchain technology in recent times.
- Proposed possible implications of blockchain technology for good corporate governance.
- To cite instances of organizations which are using or are considering blockchains technology.

3.0 Methodology

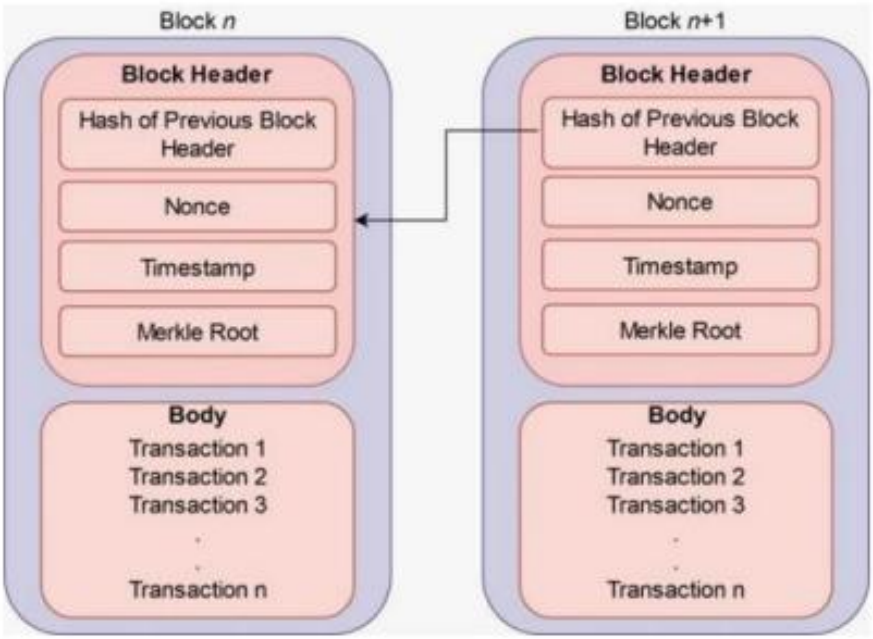
Initially, literature review of some research studies on this topic was done. After doing the initial review of existing research, three main objectives as mentioned above were specified. To meet the first objective, existing published reports, white papers, and research articles were studied and reported. Blockchain is disruptive technology and is still in its infancy stage. Based on secondary research and conceptual understanding, implications of blockchain technology on corporate governance are proposed to meet the second objective. Finally, a case-based analysis technique was used to meet the third objective.

4.0 Blockchain Technology

Blockchain technology was developed by anonymous Satoshi Nakamoto (true identity is still unknown), it is based on purely peer-to-peer version of electronic cash

known as Bitcoin (Nakamoto, 2008). Blockchain ground-breaking technologies have the potential to have an implication for many industries from education, smart cities, finance, health, logistics, to cyber security. Blockchain technology integrates multiple systems, including distributed systems and cryptography. In this framework, data and transactions are organized into units called blocks, which collectively form a blockchain. These blocks are interconnected through secure functions using cryptographic hashes, ensuring their integrity. The blockchain operates as a distributed ledger, with its data stored across multiple nodes in the network. Each block contains specific information, such as transaction details, the hash of the preceding block, timestamps, and more. This structure is illustrated in Figure 1.

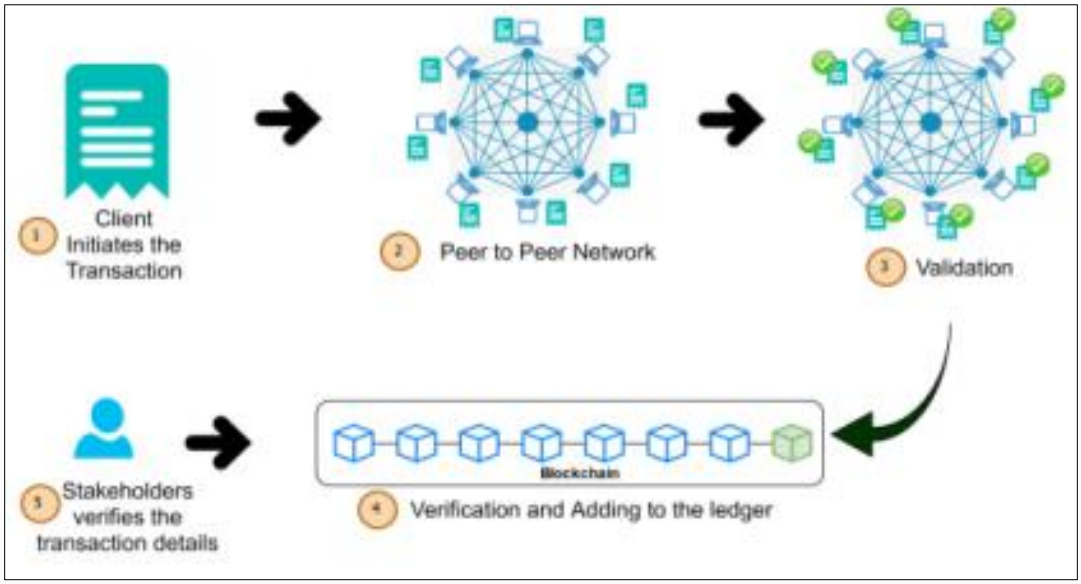
Figure 1: Block Structure



Source: MEIT, 2021

Information regarding data and transactions carried out within the network is recorded in a ledger. This ledger is maintained in a decentralized manner using a peer-to-peer network. Transactions are validated and authenticated through consensus mechanisms (consensus protocols) across the nodes within the blockchain network. The flow of online transactions within a blockchain network is illustrated in Figure 2.

Figure 2: Process of Adding New Transaction to Ledger in a Blockchain Network



Source: MEIT, 2021

Conventionally, transactions on the internet are mostly performed with some financial institution serving as a trusted third party. For instance, a centralized bank server is involved as a trusted third party in a banking transaction. Bank server maintains all its customer data in a centralized server. In blockchain, all data is stored in the form of blocks without any need for any intermediary. Taking similar example of bank transaction, transaction will be validated by any node available in the trust-based network without use of any bank server.

4.1 Private versus public Blockchain

A public blockchain is an open network that allows anyone to join without needing prior approval. It provides unrestricted access to the data stored on the blockchain, removes the need for intermediaries, and functions independently of any centralized authority. This type of blockchain is particularly useful for applications such as cryptocurrencies, NFTs, and verifying credentials like educational certificates or degrees (Vitasek *et al.*, 2022). On the other hand, private blockchain networks operate on a permissioned basis, where access is limited to authorized participants. These networks are more suitable for business use, as they ensure that only verified members can access the network and allow visibility of exchanged data only to the parties involved in the transaction.

5.0 Implications of Blockchain in Corporate Governance

5.1 Transparency

Organizations have the ability to establish a system where a distributed stock ledger is accessible only to authorized parties. This ledger automatically updates in a secure and verifiable manner whenever there is a change in asset ownership (Lewis, 2018). Blockchain technology offers numerous advantages for corporate boards (Lewis, 2018). In large companies, shareholders often depend on the board for information, with limited access to corporate records and no independent means of verifying the accuracy of the data, relying solely on the directors' trustworthiness. By utilizing blockchain, administrators can grant secure, permission-based access to real-time records, enhancing transparency and facilitating reliable communication.

In a blockchain context, corporate governance could take many different forms. Corporate assets can be issued and traded on blockchains with a number of benefits, but there are some disadvantages to greater ownership transparency. Yusuf *et al.* (2023) propounded that Blockchain can resolve agency issues and prevent information asymmetry, both of which will ultimately benefit the business in the long run.

5.2 Agency theory concerns

Agency theory suggests that the goals of business owners and their managerial agents often differ, with managers sometimes leveraging the information advantage provided by their roles to prioritize personal objectives over those that maximize profits and align with the interests of the owners (Dalton *et al.*, 2007; Fama & Jensen, 1983; Jensen & Meckling, 1976). Smart contracts have the potential to reduce certain agency-related costs (Murray *et al.*, 2019; Kaal, 2021). By utilizing blockchain technology, smart contracts provide an efficient method to oversee a firm's operations, reducing reliance on external intermediaries such as auditors to validate managerial claims, analysts to verify key performance metrics, and supply chain monitors to track transactional handoffs.

Blockchain technology has an advantageous effect on corporate governance by removing the need for middlemen through peer connectivity, code, and cooperation (Ferreira & Nikolowa, 2023)

5.3 Voting

Blockchain technology offers a reliable and secure solution for facilitating proxy voting (Lewis, 2018). For many corporations, the proxy voting process is complex, often hindered by the absence of shareholders and board members. By enabling votes to be cast and recorded on a secure blockchain ledger, this technology allows participants to engage in

the corporate voting process while also observing it in real-time. This transparency helps eliminate uncertainties surrounding election outcomes and minimizes the potential for result manipulation, making blockchain an effective tool for corporate governance (Lewis, 2018). This application could serve as a testing ground for broader adoption of blockchain in governance practices.

5.4 Financial transactions

Blockchain technology introduces a revolutionary way of recording, processing, and storing financial transactions and data, with the potential to transform the accounting and auditing fields while reshaping corporate operations. Shanti & Elessa (2023) proposed that implementing blockchain in Jordanian banks enhances the effectiveness of corporate governance, particularly in promoting information transparency. This technology improves the efficiency of financial markets, minimizes information asymmetries, reduces uncertainty regarding the current and future performance of the Bank of Jordan, fosters better relationships between shareholders and management, bolsters shareholder democracy, and promotes greater transparency in operations.

Ezzi *et al.* (2023) examined how corporate governance influences the relationship between blockchain technology and investment efficiency in European companies. Their findings revealed that the adoption of blockchain technology has a significant and positive impact on the investment efficiency of enterprises. Furthermore, the study highlighted that corporate governance acts as a mediator in the relationship between blockchain technology and investment efficiency, enhancing the overall effectiveness of investments.

6.0 Case based Analysis on the Use of Blockchain Technology by the Companies

6.1 Mercedes-Benz group

Mercedes-Benz has explored and applied blockchain technology across various domains within the organization. Recently, a pilot project focusing on supply chains was introduced. The company has tested blockchain's potential to enhance mobility solutions and optimize supply chain management processes.

6.1.1 Mobility

Mercedes-Benz envisions a future where millions of autonomous vehicles and interconnected sensors communicate seamlessly to exchange data about vehicle conditions, charging station availability, parking spots, road conditions, and repair orders. This exchange would be automated, with transactions handled through micropayments (Group, M.-B., n.d.). For example, smart contracts would automatically execute once specific

conditions are met—such as payment completion, vehicle servicing, or verification of a spare part as an authentic original—allowing the order to proceed without human involvement. Mercedes-Benz has also established its own Blockchain Factory within the Mercedes-Benz Financial Services (DFS) group to drive these innovations forward.

6.1.2 Supply chain

Mercedes-Benz Cars, in partnership with Icertis, a leading provider of cloud-based Enterprise Contract Management solutions, has developed a blockchain prototype designed to maintain consistent contract documentation throughout the supply chain. The primary goal of this initiative is to enforce and monitor adherence to Mercedes-Benz's standards and contractual commitments regarding areas such as working conditions, human rights, environmental sustainability, security, business ethics, and compliance. Any deviation by sub-suppliers from these contractual obligations is recorded and made visible within the blockchain service protocol, functioning similarly to a secure ledger system. Currently, this prototype is undergoing testing.

6.2 Anheuser-Busch InBev

AB InBev has initiated a pilot project in Europe aimed at leveraging blockchain technology to provide complete transparency and traceability throughout its barley supply chain, enabling tracking from the consumer all the way back to the farm.

6.2.1 Supply chain transparency

The pilot project will start by connecting barley farmers through a single, scalable blockchain-based platform. This platform will enable AB InBev to collect and analyze data, providing insights to help farmers enhance their crop yields and reduce their environmental impact (InBev, 2020). The initiative seeks to enhance efficiency and promote sustainability by bringing together all stakeholders in the supply chain—including farmers, malting cooperatives, breweries, warehouses, and carriers—onto a secure and decentralized platform.

6.3 Walmart

Walmart, recognized as a leader in supply chain management, has adopted blockchain technology to automate the management of invoices and payments for its third-party freight carriers (Vitasek *et al.*, 2022). Managing the transportation of vast quantities of goods across borders, time zones, and varying climates presents significant operational challenges. To address these complexities, Walmart partnered with DLT Labs, a prominent developer of enterprise solutions using distributed ledger technology.

Following extensive testing, a pilot version was launched in January 2019, which proved successful. As a result, the system, called DL Freight, was officially implemented in March 2021 (Vitasek *et al.*, 2022). This system tracks and records data at every stage of the process—from the carrier's tender offer to proof of delivery and payment approval. The information is automatically captured, synchronized in real-time, and accessible only to the involved parties. Walmart opted for a private blockchain network based on Hyperledger Fabric, an open-source framework. The system turns out to be a success for them by all accounts. Earlier 70 % of disputed invoices were reduced to 1% invoices having discrepancies. The success of Walmart's system has demonstrated the potential of blockchain. It has shown that the technology can generate significant operational and financial gains and improve supplier relations. During the implementation of this project, it was recommended to engage key stakeholders actively and carefully evaluate the advantages and disadvantages of using public versus private networks. Establishing consensus on the business rules that the blockchain network will follow, implementing a system of checks and balances, and ensuring that legacy IT systems are not entirely replaced were highlighted as crucial factors for successfully building a blockchain network.

6.4 Goldman Sachs

Goldman Sachs played a key role in co-leading the European Investment Bank's first public digital bond issuance on the Ethereum public blockchain (Goldman Sachs, 2021). This innovative approach significantly reduced settlement times and eliminated the need for a central securities depository. The process involved the creation of bond tokens on the blockchain, enabling investors to purchase and pay for these security tokens using traditional currency. Digital issuance on blockchain leads to benefits like better speed and efficiency, reduced costs, better transparency, accessible to traditional market participants (Goldman Sachs, 2021). Case-analysis of these four corporations on the use of Blockchain technology is summarized in Table 1.

7.0 Conclusion and Scope of Future Research

Research studies have indicated the wider effect that Blockchain networks can have on increased efficiency in executing transactions, better transparency, and supply chain operations. Case analysis shows that most of the big corporations such as Walmart, Mercedes Benz and Anheuser-Busch InBev tested and implemented Blockchain networks to make their supply chains more efficient, fast, transparent and secure while sharing data with the stakeholders on real time basis. They have evaluated the benefits of this technology on various parameters. Goldman Sachs has initiated Blockchain for this issuance of bonds.

It has made this financial transaction fast, transparent and reduced cost due to lessor involvement of financial intermediary.

Table 1: Case-analysis of Select Corporations using Blockchain Technology

Corporation	Sector	Blockchain Platform	Application	Implications of Blockchain	Source	Country
Mercedes Benz Group	Automobile	Collaborative model with start-up companies and Hackathon events	Increased mobility and Transport Alliance Supply Chain	Consolidate and manage supply and demand Smart contract can save enormous amount of administrative expenditure Tokenization of asset values or service. It means projects could be divided into small virtual shares and these could be sold, bought and traded.	Group, n.d.	Germany
Anheuser Busch InBev	Drink and brewing	Development by Settle Mint, a Blockchain Platform-as-a Service tech firm	Supply chain from consumer back to the farm	End-to-end supply chain to consumers Advance agriculture management Increased consumer transparency	InBev, 2020	Belgium
Walmart	Retail	Supply chain management	Hyperledger Fabric, an open-source Platform	Involve key stakeholders Weighing pros and cons of using public versus private networks Agreement on the business rules that the network will employ Having a check and balances system Not to replace legacy IT systems	Vitasek *et al.*, 2022	USA
Goldman Sachs	Banking and Financial Services	Capital markets Digital Finance	Public digital issuance on Ethereum Public blockchain	Improved speed and efficiency Reduction costs Increased transparency Accessible to traditional market participants	Goldman Sachs, 2021	USA

Source: Compiled by the authors

Current form of blockchain technology is not sufficiently fast or scalable. It's still in development and is comparable with the internet from the early 1990s. Many big technology corporations like Amazon, Alibaba are providing this technology platforms but its application in big organizations is still in its infancy stage. Most of the corporations are in the testing phase of this technology using prototype model. This paper was written with the intention to give initial insights to blockchain technology and how it can tackle some important governance issues. Scholars have numerous opportunities to explore the influence of blockchain technology on market transactions, particularly in areas such as transaction costs, trust dynamics, and the role of intermediaries. Further research could examine how blockchain networks enhance transparency, reduce agency costs, and enable efficient and corruption-free voting processes, providing deeper insights into their impact on corporate practices and effective governance.

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