**EMBRACING THE DIGITAL ERA : TRANSFORMING CORPORATE GOVERNANCE**

 Ramakrishna Vuppuluri

 Research Scholar, *Department of Commerce, Lovely Professional University, Phagwara, Punjab, India 144411*

Abhishek Pandey

*Asst Professor, Mittal School of Business, Lovely Professional University, Phagwara, Punjab, India 144411*

***ABSTRACT***

*The digital transformation of corporate governance, driven by technologies like blockchain and AI, has significant implications on business models, organizational structures, and regulatory frameworks. Blockchain technology and smart contracts offer potential for enhancing shareholder engagement, proxy voting, and reducing insider trading. However, challenges like cyber threats, data breaches, regulatory compliance, and environmental sustainability must be considered. The article highlights the need for thoughtful digital implementation to maximize benefits while addressing risks.*

Key words: Corporate governance, Blockchain technology, Cyber security, digitalization, Shareholder conflict

1. **Introduction**

The #goingdigital hashtag was used at a blockchain event organized by the OECD in Paris in September 2018. The challenge lies in understanding and adapting to the rapid technological changes.

Corporate governance is a crucial area of discussion due to the importance and confusion of technological developments. Stakeholders in the space are moving at different speeds and directions, but there is little agreement on the implications of digital transformation on business models and organizational structures. Some argue that digital technologies, like blockchain and artificial intelligence, will not disrupt corporate governance, while traditional regulatory models are robust enough to handle technological changes. However, an alternative view suggests that business models and organizations will be radically transformed by digital transformation, and existing regulatory models need to be re-examined to address the profound disruption caused by emerging technologies.

The digital transformation has significantly impacted our world, with new technologies like blockchain, AI, robotics, and sensors transforming communication, information production, and consumption. These technologies amplify each other, creating synergies that increase their social impact. While individual technologies like distributed ledgers, artificial intelligence, and robotics can have significant impacts, understanding the future of digital technology requires considering the combination of emerging technologies, such as Big Data, advanced analytics, and human-machine interfacing. The convergence of robotics and computer sciences is a key aspect of this technological disruption.

These amplifying effects will generate new opportunities while challenging current business models, organizational structures, and regulatory frameworks.

New technologies bring about uncertainty and risk in the digital world, making it difficult to understand and predict future developments. This uncertainty makes it difficult to know the current state of technology or the direction of future developments, impacting government, scientific communities, businesses, and the general public.

Several High profile business scandals resulted into framing “Corporate governance” in different countries. Agency theory explains the principal agent relationship. The agency hypothesis explains the primary agent connection. It claims that the division of management and ownership results in a division of an agent's obligations and liabilities. The agent represents the principal in a particular economic deal and is expected to represent the principal's best interests irrespective of personal gain (Mitnick, 2015).

Conflict may arise between the principal and the agent since not all agents will always act in the principal's best interests (Hill and Jones, 1992). The misunderstanding and argument could lead to a number of conflicts. According to research, the atmosphere that fosters conflict is mostly driven by the behavior of passive investors. Incompatibility of stakeholders might result in inefficiencies and financial losses. As a result, every business must deal with the principal-agent conflicts.

Digitalization in corporate governance involves integrating digital technologies and data-driven processes to improve management, operations, and governance. It streamlines decision-making, communication, transparency, and accountability, enabling real-time access to information and better stakeholder engagement and collaboration among stakeholders. Key components of digitalization include virtual board meetings, digital communication platforms, electronic voting systems, data analytics, cybersecurity measures, and digital initiatives for corporate social responsibility. However, companies must address challenges like cyber security, privacy, regulatory compliance, and equitable access to technology to fully benefit from digital transformation in the governance landscape.

In the domain of corporate governance, there is a lot of interest in new technologies, but there is far less consensus on what the digital transformation implies for the future of business models, organizational structure, and corporate governance (Fenwick & Vermeulen, 2018).

According to Lindman et al. (2017), "the key technological enablers of recent developments in distributed transaction and ledger systems" are blockchain technology and the underlying distributed database technologies. Blockchain technology revolutionizes economic systems by transforming transaction, property, and trust concepts. Originally developed for cryptocurrency transactions, it has evolved across various sectors, including banks, insurance companies, financial markets, and voting systems. (Dai & Vasarhelyi, 2017; Tarasov & Tewari, 2017; Risius & Spohrer, 2017; Holub & Johnson, 2017; Guo & Liang, 2016)

Even if empirical research is currently missing to determine the precise impact of technology on corporate governance, blockchain technology can have an impact on a variety of business operations (Esposito De Falco & Cucari, 2018). For Principal-agent conflict explored in corporate governance research, blockchain advancements open new avenues.

1. **Corporate Governance**

Corporate governance is crucial for the success of any organization, regardless of size. High corporate governance standards are essential for an organization to function well. (LSE, 2012; Zhuang, 1999) Guidelines like the UK Corporate Governance Code, Sarbanes Oxley Act, Cadbury Code, South Africa's King 1, II, III, and IV reports, Kotak Committee’s recommendations are examples of guiding principles. However, following codes alone is insufficient; it is necessary to transcend connections and trust (LSE, 2012; OECD, 2015; Nadaf & Navi, 2017). Corporate governance aims to create an environment that encourages long-term investment, financial stability, and commercial integrity, supporting growth and inclusive societies (OECD, 2015: 7).

Effective corporate governance procedures foster a supportive culture, improve risk management (LSE, 2012; Vagneur, 2004), and guard against scandals (Nadaf & Navi, 2017; McDonough, 2002). Companies with effective corporate governance have risk and uncertainty mitigation strategies in place (OECD, 2015). The roles and obligations of shareholders, investors, and management are outlined in the corporate governance code. Protecting investor wealth and allowing them to participate in business strategy decisions are essential rules (OECD, 2015; Nadaf & Navi, 2017). Poor corporate governance can lead to the loss of shareholder wealth and other catastrophic effects on businesses.

1. **Block Chain Technology**

A blockchain system is a distributed database, decentralized consensus mechanism, and cryptographic algorithms that enable users to transact valuable assets without relying on a central authority. This system stores transactional data in an infinite sequence of interconnected blocks, with a decentralized time stamping algorithm allowing users to vote on database updates and agree on transaction order (Hawlitschek, et al, 2018).

In general, the study literature discusses two types of blockchain applications that have an impact on the principal-agent conflict: smart contracts and a reliable distributed ledger with a platform for transactions. We shall quickly explain both.

*Smart Contracts:* Contracts known as "smart contracts" are held in computer code that are carried out independent of third parties (Swan , 2015; Marcini et al 2018). Smart contracts have the potential to lessen management's influence while increasing shareholder transparency (Hsieh et al., 2017).

*Reliable distributed Ledger:* The blockchain is a public register, allowing the public to access transactions without a central authority. Users can download each blockchain, containing past transactions. To manage the register, global history changes are needed, requiring an overwhelming computing power (Magnier et al 2018). This application aids in creating basic cryptocurrencies like Bitcoin. The fundamental effect of this application on corporate governance is complete transparency regarding the recorded transactions.

The two blockchain applications listed above have different effects on the principal-agent conflict, as one could expect. While just using a blockchain as a ledger is quite practical and could have a good impact in the near future, the usage of smart contracts has a far greater potential but will most likely take more time to develop (Ivaninskiy, I. 2019).

* 1. Smart contracts: As a mitigation of conflicts relating to board of directors:

Board functions, such as audit, can be simplified and automated in organizations using smart contracts (Chedrawi et al., 2018), preventing management manipulation and enhancing the effectiveness of independent boards (Xie et al., 2003). According to several authors, blockchain can be used to create unchangeable accounting records, which would greatly simplify and raise the level of audit quality (Byström, H. 2019; Peters et al., 2016).

‘Smart contracts’ provide automated commitment execution without the need for a third party. Compensation is an illustration of such a commitment between a company's shareholders and management. Conflict between management and shareholders becomes impossible if management's compensation is incorporated in a smart contract that relates it to the company's performance from the start of the relationship. Wright and Filippi (2015) make a very simple suggestion regarding how smart contracts will affect managerial remuneration. Smart contracts may be utilized for compensation and for automated payouts when performance targets are met, according to Yermack (2017). Managerial remuneration is regarded by W.A. Kaal (2021) as a component of agency costs. According to him, using blockchain to resolve principal-agent conflicts would make it possible to reduce all agency costs, including those brought on by managerial remuneration.

Smart contracts for managerial remuneration compensation introduce risks, though theoretically negate conflicts, as fraudulent management can exploit computer code glitches as happened in other financial transactions (Kaal 2021).

* 1. Reliable Distributed Ledger – For security transactions
		1. Shareholders have to vote for proposals for board composition, directors' independence, compensation, and qualifications at annual meetings (Ertimur et al, 2010). Management's board composition proposals have the lowest support rate (Kahan et al, 2007). Management aims to create a friendly board, while shareholders seek independent directors to maintain control (Warther 1998). However, management often chooses the board, winning in the conflict (Rosenstein et al.,1990).
		2. Conflict between shareholders and managers arises when the management team—particularly the CEO—gains undue power within the company and has the ability to control the board of directors. (Jensen 1993; Shleifer & Vishny 1997). Passive investor conduct lies at the heart of the ecosystem that makes the conflict conceivable (Roe 1991). Non-transparent voting processes influenced by management contribute to low shareholder voting turnout. Issues like inexact lists, incomplete ballot distribution, and chaotic tabulation hinder small shareholders' participation (Kahan 2007). Reducing turnout costs by implementing blockchain increases participation at AGMs (Van der Elst et al., 2017). Yermack (2017) and Wright et al., (2015) indicate corporate voting conducted using blockchain technology would be substantially more transparent because it would allow for "faster, more accurate vote tabulation and equal real-time transparency of the likely voting outcome for both management and dissident shareholders."
		3. Corporate voting strategies, such as 'empty voting', involve investors voting with borrowed shares before the vote, increasing their voting power. Blockchain-based transactions could potentially stop this practice by providing immediate transparency and making voting rights distribution more problematic (Malinova et al., 2017). Yermack (2017) notes that adopting blockchain to register transactions would minimize “insider selling” by management in addition to making “empty voting” more problematic because all transactions would be more visible. A decrease in insider trading would lessen the conflict even more because it wouldn't put the management in a better position relative to other shareholders.
		4. Van der Elst et al., (2017) argue that board of directors' technical functions, like appointment of additional director when a director resigns in between two AGM’s, may be unnecessary if voting using blockchain is implemented directly by shareholders.
	2. Advantages of blockchain technology in corporate governance
		1. Transparency of ownership

 All transactions are transparent and made visible to all members of the network.

* + 1. Improved liquidity

Liquidity refers to trading a large quantity of a security at low cost in a short time (Holden et al., 2013). Blockchains can improve liquidity by reducing costs and shortening trading times, whether used for share registration or post-trade clearing and settlement.

* + 1. Impact on institutional investors and activists

Greater transparency may discourage activists and raiders from investing in blockchain-traded firms, as they view it as costly and seek secret share positions (Bebchuk and Jackson 2012).

* + 1. Impact on insider trading

Blockchain share trading could enable real-time observation of managers' trades, exposing them to scrutiny from boards and shareholders. This would reduce managers' profits from insider trading, potentially reducing their alignment with shareholders.

* + 1. Voting in General meetings

Blockchain technology proposes a viable alternative to traditional corporate proxy voting, replacing outdated methods with modern technology.

* + 1. Blockchain technology is being tested by stock exchanges throughout the world as a way for businesses to list, sell, and vote their shares, and investors may benefit from lower trading costs and quicker transfers of ownership, more accurate records, and increased transparency
	1. Salvatore Esposito De Falco, Nicola Cucari , Emanuele Canuti and Stefano Modena had conducted a research on survey approach and their findings show that record ownership, proxy voting, and turnout rate are the areas where the use of blockchain technology will have the biggest long-term effects, according to the board members, while increased market liquidity and transparency are predicted to have the biggest long-term effects by institutional investors.
	2. These illustrations highlight the potential benefits of retrofitting. Retrofitting is the process of "adding" digital solutions to outdated systems, models, and organizations in an effort to "future proof" and improve the efficiency of the current strategy.
	3. In contrast to what has been addressed here, new technologies might instead offer a fundamentally different method of approaching or conceptualizing the issue rather than a new tech-driven solution for old problems.
1. **Regulatory Position**

The most recent digital changes to regulatory frameworks include a strong emphasis on transparency and compliance requirements for listings as well as shareholder participation and information. Stock exchanges have recommended adopting blockchains as a new means for trading corporate securities and monitoring their ownership, and several significant companies in the financial sector have started to invest in this new technology.

* 1. Regulatory position of digitalization of Corporate Governance in India

* + 1. For Shareholders’ meetings

The Companies Act of 2013 allows directors to participate in board meetings through video conferencing (VC) or audiovisual means (OVAM). (MCA,2023) Restrictions on approval of annual financial statements, Board reports, and prospectus in such VC meetings have been removed. Companies can also convene Annual General Meetings (AGM) and Extraordinary General Meetings (EGM) through VC and OVAM, as per the COVID-19 pandemic circulars issued by Ministry of Corporate Affairs, India as on date.

As per SEBI regulation no 44, for all shareholder resolutions, the listed company must provide its shareholders the facility of remote electronic voting.

Understandably, the broad adoption of virtual general shareholder meetings has the potential to encourage shareholder involvement and participation and may eventually become a permanent feature of corporate governance.

* + 1. For Shareholders’ information

The listed entity shall send the copies of full annual report to shareholders who have registered their e mail id with the company or any depository. (LODR 36)

The listed entity must use any of the electronic methods of payment approved by Reserve Bank of India when making the payment of dividends, interest, and amounts due upon redemption or repayment. ( LODR regulation 12)

LODR regulation 46 gives the complete list of information to be displayed on a separate section on the website of the listed entity. The list comprises of so much information that is useful for the shareholders.

Companies Act 2013 stipulates under various sections certain information such as Financial statements, Board’s report, CSR Policy, unpaid dividend account details, etc are to be disclosed on the company’s website.

* + 1. For Regulatory compliance

All the compliance reports, documents and filings by private limited company , public limited or one man company as required under the Companies Act 2013 are to be filed through Ministry of Corporate Affairs portal [www.mca.gov.in](http://www.mca.gov.in). However Digital technology' dynamic nature makes it difficult to ensure compliance. The challenges businesses encounter while navigating the confusing regulatory environment are to be addressed for better compliance.

The listed entity must use the electronic platform defined by the Board or the recognized stock exchange(s) to submit reports, statements, documents, filings, and any other information to the recognized stock exchange(s). (LODR regulation10)

* 1. Status of digitalization of Corporate Governance regulatory mechanism in different parts of the world
		1. Governments and companies are experimenting with blockchain technologies at an increasing rate. For instance, in the summer of 2017, Delaware changed its corporation legislation to allow businesses to use blockchain technology to keep track of their stock ledgers and other corporate data. The Shanghai Stock Exchange (SSE), the world's fourth-largest stock exchange, announced plans to use blockchain and other distributed ledger technology in securities transactions in July 2018. The SSE adheres to other programs. Using its exchange in Estonia, Nasdaq tested blockchain technology with success in a proxy voting experiment. For clearing and settlement operations, the Australian Stock Exchange has begun to research distributed ledger technology solutions. IBM and the Japan Exchange Group are working together to research blockchain solutions for low-liquidity assets (Fenwick & Vermeulen, 2018). India’s National Stock exchange in 2017 conducted a block chain on a trial basis of a Know your customer data protocol.
		2. Supervisory technology (SupTech) tools and solutions enhance regulatory efficiency and effectiveness by automating complex processes, enhancing oversight, surveillance, and analytical capabilities, benefiting financial stability and market integrity (Denis 2021).
		3. The following table gives a selection of SupTech initiatives ( Extracted from OECD going digital tool kit (Denis 2021)

|  |  |  |  |
| --- | --- | --- | --- |
| **Subject** | **System** | **Responsible entity** | **Project Description** |
| Improving Misconduct analysis | Project Appolo | Monetary authority of Singapore (MAS) | AI based tool used along side other analytical frameworks in the triaging of cases for investigation |
|   | Neutral language processing to detect AML/CFT infringements | Mexico's national banking and securities commission(CNBV) | Application to identify suspect AML/CFT network activity to enable the identification of anomalous transactions |
|   | Machine learning tools to analyse unstructured data | Columbia's Financial Superintendency (SFC) | To analyse market sentiment and market behaviour. It has enabled the automation of information gathering |
| Improving market surveillance | Market analysis and intelligence (MAI) platform | Australian Securities and Investment commission (ASIC) | A real-time monitoring alert system that looks for irregularities in order and trade messages for traded securities |
|   | Automated alarm and market monitoring system (ALMA) project | German Federal Financial Supervisory Authority (BaFin) | For the automated identification of cases of insider trading |
|   | Market Analytic platform | Canadian securities administration (CSA) | For analyzing probable violations of insider trading and market manipulation on the Canadian exchanges and alternative trading system |
| Improving regulatory reporting | AI evaluation of listed businesses' corporate governance disclosures' quality | Malaysian securities commission (SC Malaysia) | To keep an eye on listed companies' adherence to corporate best practices and the caliber of their disclosures on the Malaysian stock exchange |
|   | Data collection Gateway | Monetary authority of Singapore (MAS) | The MAS data collection capacity by addressing issues MAS and financial institutions both confront  |
|   | SEDAR+ National filing system | Canadian securities administration (CSA) | To unify and modernize its current national systems and databases, which include: System for Electronic Document Analysis and Retrieval (SEDAR), System for Electronic Disclosure by Insiders (SEDI), Cease-Trade Order Database (CTO), National Registration Database (NRD), National Registration Search (NRS), Disciplined List (DL), and a variety of filings currently made in paper for various purposes, CSA is developing an integrated and comprehensive records filing and disclosure system (named SEDAR+). |
| Improving data management | Cloud computing to process large data volumes | Mexico’s National Banking and Securities Commission (CNBV) | A project using cloud computing is now being carried out by the CNBV to process a lot of data related to anti-money laundering (AML) compliance. |
|   | Digital Forensics | Janpan's securities and exchange Surveillance commission(SESC) | SESC is improving digital forensic technology and creating a cutting-edge environment for the preservation, restoration, analysis, and storage of electronic data. |

Source: Authors’ summarization from “OECD going digital tool kit” (Denis 2021)

* 1. Challenges and risks of digitalization in corporate governance

The hazards and problems of digitization are identified by researchers. These might include Cyber attacks, data breaches, problems with regulatory compliance etc.

London head quartered Cyber management alliance limited – a world leader in cyber security consultancy gives the following mind boggling information for the month of May 2023 in their website: (https: //www.cm-alliance.com/cybersecurity-blog/may-2023-recent-cyber-attacks-data-breaches-ransomware-attacks) accessed on 20th July 2023.

|  |  |
| --- | --- |
| Ransomware attacks in May 2023 |  16 incidents |
| Data breaches in May 2023 | 20 incidents |
| Cyber attacks in May 2023 | 10 incidents |

Source: Authors’ summarization from above referred website of Cyber management alliance ltd.

1. **Conclusion**
	1. The article highlights the potential of digital transformation, particularly blockchain technology and smart contracts, in improving corporate governance practices. By leveraging these technologies, businesses can enhance transparency, accountability, and stakeholder engagement, leading to better decision-making processes and reduced agency conflicts.
	2. The two blockchain applications listed above have different effects on the principal-agent conflict. While just using a blockchain as a ledger is quite practical and could have a good impact in the near future, the usage of smart contracts has a far greater potential but will most likely take more time to develop (Ivaninskiy 2019). In conclusion, blockchain technology might offer an innovative and different governance system that can lower agency expenses and build more confidence in the contractual relationship between the principal and the agent, boosting the effectiveness of the relationship agency.
	3. The adoption of blockchain technology raises environmental concerns due to corporate sustainability guidelines (Lozano, 2015). The contrasting results of bitcoin and blockchain technology raise questions about their sustainability (Vranken, 2017; Giungato et al., 2017; Dalal, 2014). Institutional investors are increasingly aware of ESG factors when allocating assets (Luo et al., 2015).
	4. However, there are a number of crucial issues from the standpoint of corporate governance that are currently underrepresented in academic literature. What technological skills must businesses have in order to properly use a blockchain technology. Are they unique from other IT projects, for instance? What is the best method for controlling a blockchain? Should the organization create a special board of directors committee, special department, or blockchain subsidiary? How might a blockchain implementation project best staff itself? Should a startup be purchased with a proven team instead of hiring an industry expert as a board member or member of top management? These inquiries highlight further how there is plenty of room for more investigation on this subject.
	5. The regulators and companies have to examine thoroughly all aspects before embarking on new technologies.

**References**

Bebchuk, L. and Jackson, R. (2012) The law and economics of blockholder disclosure, Harvard Business Law Review 2, 39–60.

Byström, H. (2019). Blockchains, real-time accounting, and the future of credit risk modeling. *Ledger*, *4*.

Chedrawi, C., & Howayeck, P. (2018). Audit in the Blockchain era within a principal-agent approach. *Information and Communication Technologies in Organizations and Society (ICTO 2018):“Information and Communications Technologies for an Inclusive World*.

Dai, J., & Vasarhelyi, M. A. (2017). Toward blockchain-based accounting and assurance. Journal of Information Systems, 31(3),5-21

Dalal, N. (2014). Exploring the bitcoin system: A complex econosociotechnical systems (CEST) perspective. International Journal of Conceptions on Management and Social Sciences, 2, 47–51

Denis, E. (2021). The promises and pitfalls of SupTech for corporate governance-related enforcement. OECD going digital tool kit notes no 10.

Ertimur, Y., Ferri, F., & Stubben, S. R. (2010). Board of directors' responsiveness to shareholders: Evidence from shareholder proposals. Journal of corporate finance, 16(1), 53-72.

Esposito De Falco, S., & Cucari, N. (2018). Una reinterpretazione della corporate governance alla luce della tecnologia blockchain: nuove prospettive. Sinergie-SIMA 2018 Conference Proceeding “Transformative business strategies and new patterns for value creation” 14-15 June 2018

Esposito De Falco, S., Cucari, N., Canuti, E., & Modena, S. (2019). Corporate governance and blockchain: Some preliminary results by a survey. *Corporate Governance: Search for the Advanced Practices,* 102-115.

Fenwick, M., & Vermeulen, E. P. (2018). Technology and corporate governance: Blockchain, crypto, and artificial intelligence

Giungato, P., Rana, R., Tarabella, A., & Tricase, C. (2017). Current trends in sustainability of bitcoins and related blockchain technology. Sustainability, 9(12), 2214

Guo, Y., & Liang, C. (2016). Blockchain application and outlook in the banking industry. Financial Innovation, 2: 24.

Hawlitschek, F., Notheisen, B., & Teubner, T. (2018). The limits of trust-free systems: A literature review on blockchain technology and trust in the sharing economy. Electronic commerce research and applications, 29, 50-63.

Hill, C.W. and Jones, T.M., 1992. Stakeholder­agency theory. Journal of management studies, 29(2), pp.131-154

Holden, C., Jacobsen, S., and Subrahmanyam, A. (2013) The empirical analysis of liquidity, Foundations and Trends in Finance 8, 265–365

Holub, M., & Johnson, J. (2017). Mapping bitcoin's influence on academic research

Hsieh, Y. Y., Vergne, J. P. J., & Wang, S. (2017). The internal and external governance of blockchain-based organizations: Evidence from cryptocurrencies. In *Bitcoin and beyond* (pp. 48-68). Routledge.

Ivaninskiy, I. (2019). The impact of the digital transformation of business on corporate governance. An overview of recent studies. *Корпоративные финансы*, *13*(3), 35-47.

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *the Journal of Finance*, *48*(3), 831-880.

Kaal, W. A. (2021). Blockchain solutions for agency problems in corporate governance. In *Information for efficient decision making: Big data, blockchain and relevance* (pp. 313-329).

Kahan, M., & Rock, E. (2007). The hanging chads of corporate voting. *Geo. LJ*, *96*, 1227.

Lindman, J., Tuunainen, V. K., & Rossi, M. (2017). Opportunities and risks of blockchain technologies–a research agenda. Proceedings of the 50th Hawaii International Conference on System Sciences, 1533-1542. https://doi.org/10 .24251/HICSS.2017.185

Lozano, R. (2015). A holistic perspective on corporate sustainability drivers. Corporate Social Responsibility and Environmental Management, 22(1), 32- 44

London Stock Exchange. (2012). Corporate Governance for Main Market and AIM Companies. White Page Ltd

Magnier, V., & Barban, P. (2018). THE POTENTIAL IMPACT OF BLOCKCHAINS ON CORPORATE GOVERNANCE: A SURVEY ON SHAREHOLDERS’RIGHTS IN THE DIGITAL ERA. *InterEULawEast: journal for the international and european law, economics and market integrations*, *5*(2), 189-226.

Malinova, K., & Park, A. (2017). Market design with blockchain technology. *Available at SSRN 2785626*.

MCA, 2023 <https://www.mca.gov.in/content/mca/global/en/acts-rules/ebooks/acts.html?act=NTk2MQ==#Meetings_of_Board>, accessed on 18/07/2023

Macrinici, D., Cartofeanu, C., & Gao, S. (2018). Smart contract applications within blockchain technology: A systematic mapping study. *Telematics and Informatics*, *35*(8), 2337-2354.

McDonough, W. J. (2002). Issues in corporate governance, Federal Reserve Bank of New York. Current Issues, 8(8).

Mitnick, B.M., 2015. Agency theory. Wiley encyclopedia of management, pp.1-6.

Nadaf, S. M., & Navi, B. S. (2017). Corporate Governance: Issues, Opportunities and Challenges. International Journal of Commerce and Management Research, 3(7), 66-77

OECD. (2015). G20/OECD Principles of Corporate Governance. OECD Publishing, Paris. <https://doi.org/10.1002/bl.30032>

Peters, G. W., & Panayi, E. (2016). *Understanding modern banking ledgers through blockchain technologies: Future of transaction processing and smart contracts on the internet of money* (pp. 239-278). Springer International Publishing.

Risius, M., & Spohrer, K. (2017). A blockchain research framework. Business & Information Systems Engineering, 59(6), 385-409.

Roe, M. J. (1991). A political theory of American corporate finance. *Colum. L. Rev.*, *91*, 10.

Rosenstein, S., & Wyatt, J. G. (1990). Outside directors, board independence, and shareholder wealth. *Journal of financial economics*, *26*(2), 175-191.

Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The journal of finance*, *52*(2), 737-783.

Swan, M. (2015). *Blockchain: Blueprint for a new economy*. " O'Reilly Media, Inc.".

Tarasov, P., & Tewari, H. (2017). The future of e-voting. IADIS International Journal on Computer Science & Information Systems, 12(2), 148-165.

Vagneur, K. (2004). Corporate Governance. Edinburgh Business School, Great Britain

Van der Elst, C., & Lafarre, A. (2017). Bringing the AGM to the 21st century: Blockchain and smart contracting tech for shareholder involvement. *European Corporate Governance Institute (ECGI)-Law Working Paper*, (358).

Vranken, H. (2017). Sustainability of bitcoin and blockchains. Current Opinion in Environmental Sustainability, 28, 1-9.

Warther, V. A. (1998). Board effectiveness and board dissent: A model of the board's relationship to management and shareholders. *Journal of Corporate Finance*, *4*(1), 53-70.

Wright, A., & De Filippi, P. (2015). Decentralized blockchain technology and the rise of lex cryptographia. *Available at SSRN 2580664*.

Xie, B., Davidson III, W. N., & DaDalt, P. J. (2003). Earnings management and corporate governance: the role of the board and the audit committee. *Journal of corporate finance*, *9*(3), 295-316.

Yermack, D. (2017). Corporate governance and blockchains. *Review of finance*, *21*(1), 7-31.

Zhuang, J. (1999). some Conceptual issues of corporate governance. Asian development Bank, EDRC Briefing Notes