Pertanika Proceedings 1 (1): 11 - 15 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Improving CSR Transparency Through Blockchain

Silviu Ojog[1] and Alina-Andrea Miron[2]*

[1]*Faculty of Economic Informatics and Cybernetics, Bucharest University of Economic Studies, 010552 Bucharest, Romania*
[2]*Faculty of Marketing, Bucharest University of Economic Studies, 010404 Bucharest, Romania*

ABSTRACT

The Blockchain could potentially transform the way CSR reporting is conducted. Initially, Bitcoin brought blockchain into public opinion for peer-to-peer immutable decentralized financial transactions. The second generation of blockchains, Ethereum, has introduced the concept of smart contracts, immutable pieces of code saved on the blockchain. Smart contracts elevate transactions into trust-minimizing agreements, thus disrupting existing markets and organizations. A CSR report outlines a company's environmental, social, and ethical efforts, highlighting its impact on society. It informs stakeholders about the company's commitment to sustainability. However, challenges like transparency, data manipulation, and inconsistent standards persist in traditional CSR reporting. Many reporting needs, such as trust between multiple parties, transparency, progress monitoring, autonomy and automation, seem to be covered by the blockchain value proposition: a distributed, immutable, publicly accessible ledger. Regardless of its potential, blockchain has lacked massive adoption due to its still very technical, security-oriented nature. This paper includes an in-depth review of academic literature to outline the current understanding of CSR reporting and blockchain technology. It proposes a theoretical framework for implementing blockchain in website CSR reporting.

Keywords: Blockchain, CSR reporting, Ethereum, smart contracts, social responsibility

INTRODUCTION

The European Union introduced the Corporate Sustainability and Responsibility Directive (CSRD) to improve transparency and standardization in environmental, social, and governance (ESG) reporting for companies operating within the EU (European Union, 2022).

The EU Directive (2014/95/EU) requires large public-interest companies with over 500 employees to disclose ESG information from 2018, aligning with global

ARTICLE INFO

Article history:
Received: 09 January 2025
Published: 17 February 2025

DOI: https://doi.org/10.47836/pp.1.1.003

E-mail addresses:
silviu.ojog@csie.ase.ro (Silviu Ojog)
alina.miron@mk.ase.ro (Alina-Andrea Miron)
* Corresponding author

© Universiti Putra Malaysia Press

standards like the Global Reporting Initiative (European Union, 2014). Since 2017, the European Commission has guided non-financial reporting standardization. On January 5, 2023, the CSRD expanded these requirements to more large companies, listed SMEs, and non-EU firms with over EUR 150 million in EU revenue (European Commission, 2023).

A non-financial report provides qualitative and quantitative details on how a company integrates ESG (environmental, social, governance) into its operations and outcomes (Daub, 2007). According to Moravcikova et al. (2015), CSR (Corporate Social Responsibility) communications offer significant advantages, including transparency, supervision of CSR activities, stakeholder involvement, and cross-sector cooperation, thereby enhancing their value.

Einwiller and Carroll (2020) found that negative Corporate Social Performance (CSP) often involves environmental and labour issues such as emissions, accidents, and health problems. While regulations and International Labour Organization guidelines require reporting on greenhouse gas emissions, energy use, and occupational accidents, companies tend to disclose unavoidable negative CSP and hide less visible issues.

Transparency is crucial in CSR reporting, and blockchain technology can enhance it. Blockchain is a secure distributed digital ledger that can be programmed to record data and anything of value beyond financial transactions. Distributed Ledger Technology (DLT) is the Internet's third generation, Web 3.0. Unlike the current Web 2.0, where data hosting and communication mainly depend on private servers owned by private companies, DLT allows different interactions without intermediaries (Tapscott & Tapscott, 2018).

MATERIALS AND METHODS

The study examined specialized articles on CSR reporting, identified existing solutions, and explored the use of blockchain to enhance CSR reporting through theoretical scenarios. This article focused on the challenges of website reporting. While common, company websites can be manipulated, allowing for editing or deleting content and reports, which may obscure information.

Nakamoto (2008) defined blockchain as an immutable, append-only, ordered, timestamped, transparent, and consistent ledger. As Sarajoti et al. (2023) emphasized, these attributes make it suitable for CSR reporting. Moreover, it is secure in terms of identification, authentication, and authorization.

Blockchain can serve as a CSR reporting system by tracking reporting data such as sustainability metrics, recording compliance documents, verifying certifications, linking reports to unique identifiers, and sharing transparency data with stakeholders.

Cryptographic provenance standards reveal when, how, and by whom a particular piece of data was created, offering a practical, high-impact method for reducing disinformation in CSR reporting. Additionally, hash functions ensure data integrity on the blockchain. A hash function is a mathematical function that generates a unique, fixed-size string from

input data, acting as a digital fingerprint. Any change in the input results in a completely different output, making it difficult to reverse or alter data undetected.

The core resilience of blockchain technology is its decentralized or distributed structure. Multiple participants or "peers" operate the blockchain; they form a network of nodes, each with equal authority. If discrepancies arise between blockchains maintained by different peers—whether from tampering or other issues—the consensus is determined by the majority hash, as the network collectively agrees, as depicted in Figure 1.

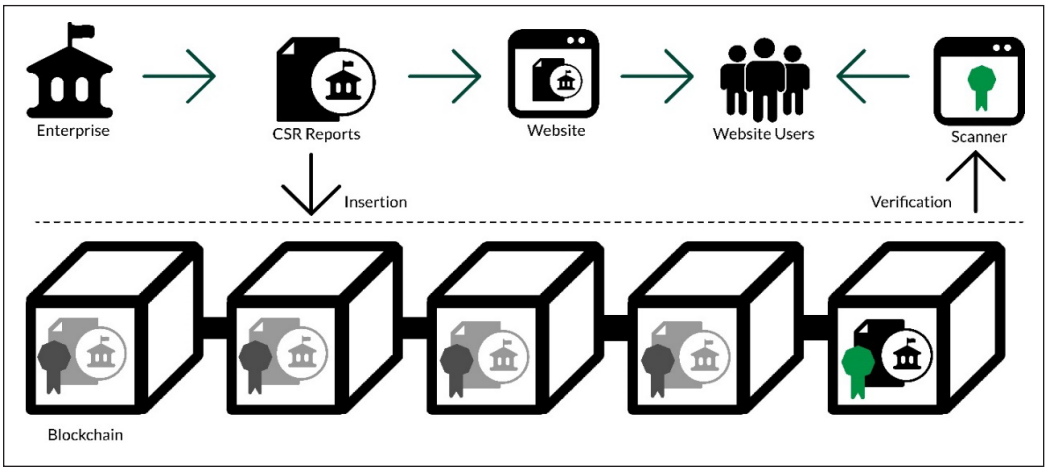

Figure 1. Blockchain entry verification (Authors' creation)

Ethereum revolutionized the blockchain landscape by introducing smart contracts and self-executing agreements with the terms directly written into code. When a smart contract is deployed, it is stored as a bytecode. This bytecode represents the compiled code of the smart contract and is recorded on the blockchain along with a timestamp, ensuring transparency and immutability (Buterin, 2014). This setup allows for automated, trustless transactions and interactions. In the Ethereum network, two notable standards exist: ERC20 and ERC721, which outline how to create and manage fungible and non-fungible tokens. Non-fungible tokens (NFTs) are unique and non-interchangeable; each NFT is distinct and cannot be exchanged on a one-to-one basis with another. NFTs have become popular for digital art and collectables. They help artists gain proper recognition and compensation, addressing issues of digital ownership and attribution in an age where copying and sharing can undermine the value of their work. Nevertheless, the variety of NFT use cases continues to expand.

RESULTS AND DISCUSSION

CSR reports can be represented as NFTs. The ERC721 standard ensures that NFTs can be created, managed, and transferred across the Ethereum network. Each token has a unique

identifier that differentiates it from others. A key difference from traditional NFT is that CSR reports do not require transfer. Another aspect worth noting is that while NFTs' unique identifiers and ownership information are stored on the Ethereum blockchain, the attributes and metadata are often stored off-chain, mainly because of high transaction costs (Ojog, 2024).

NFTs are also making significant strides in DeFi (Decentralized Finance), which refers to financial services and products built on blockchain operated without traditional intermediaries. Within DeFi, NFTs are utilized in a variety of innovative ways such as (1) breeding, NFTs are combined to create new assets; (2) burning, where NFTs are permanently removed from circulation; (3) merging, which allows NFTs to be combined into a new, more valuable token, (4) fractional ownership, enabling multiple parties to own a share of a high-value NFT, (5) staking, where NFTs are used to earn rewards in decentralized platforms, and (6) airdrops, where NFTs are distributed to users as part of promotional or incentive programs. The exploration and experimentation with these applications are ongoing, continually expanding how NFTs interact with and enhance the DeFi ecosystem (Ojog, 2021).

NFTs can be effectively integrated with DAOs (Decentralized Autonomous Organizations), blockchain-based entities governed by smart contracts and managed collectively by their members through a voting mechanism. By leveraging NFTs within DAOs, organizations can represent ownership stakes, voting rights, or unique membership statuses as digital tokens. This integration can enhance transparency and engagement, as NFTs can provide verifiable proof of participation and contribution. For CSR reporting, DAOs using NFTs offer a novel approach to tracking and verifying contributions and impact. NFTs can record and showcase CSR initiatives, reward stakeholders for their involvement, and ensure accurate and tamper-proof reporting. This synergy between NFTs and DAOs holds the potential for more accountable and transparent CSR practices, allowing organizations to demonstrate their commitment to social and environmental goals in a decentralized and verifiable manner.

CONCLUSION

Mainstream blockchain adoption constantly faces challenges, such as improving user experience, addressing scalability, tackling market manipulation and overcoming restrictive legislation. Assessing proper use cases that create high value can soften these hurdles.

Organizations can achieve greater transparency, accountability, and engagement in their CSR initiatives by utilizing some of the latest blockchain innovations, such as NFTs and DAOs. NFTs can provide verifiable records of contributions and achievements, while DAOs can facilitate decentralized decision-making and stakeholder involvement. This approach ensures that CSR activities are documented, immutable and transparent and that

the stakeholders have a clear and accurate view of a company's social and environmental impact.

Ultimately, these innovations can lead to more credible and effective CSR reporting, fostering trust and demonstrating a genuine commitment to responsible and ethical practices.

ACKNOWLEDGEMENT

The authors thank Prof. Dr. Alin Stancu for his guidance and support throughout the research process. They also acknowledge the support of Prof. Dr. Jamilah Hj. Ahmad and Dr. Ng See Kee, who have contributed to completing this work through their support and inspiration.

REFERENCES

Buterin, V. (2014). *Ethereum whitepaper: A next-generation smart contract and decentralized application platform*. Ethereum.

Daub, C. H. (2007). Assessing the quality of sustainability reporting: An alternative methodological approach. *Journal of Cleaner Production, 15*(1), 75–85. https://doi.org/10.1016/j.jclepro.2005.08.013

Einwiller, S. A., & Carroll, C. E. (2020). Negative disclosures in corporate social responsibility reporting. *Corporate Communications: An International Journal, 25*(2), 319–337. https://doi.org/10.1108/ccij-05-2019-0054

European Commission. (2023). *Corporate Sustainability Reporting*. European Commission.

European Union. (2014). Directive 2014/95/EU of the European parliament and of the council of 22 October 2014, amending directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups. *Official Journal of the European Union, L 330*, 1–9.

European Union. (2022). Directive (EU) 2022/2464 of the European parliament and of the council of 14 December 2022, amending directive 2013/34/EU, directive 2004/109/EC, directive 2006/43/EC and regulation (EU) no 537/2014, as regards corporate sustainability reporting. *Official Journal of the European Union, L 322*, 1–15.

Moravcikova, K., Stefanikova, Ľ., & Rypakova, M. (2015). CSR reporting as an important tool of CSR communication. *Procedia Economics and Finance, 26*, 332–338. https://doi.org/10.1016/S2212-5671(15)00861-8

Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*. Bitcoin.org

Ojog, S. (2021). The emerging world of decentralized finance. *Informatica Economică, 25*(4), 43–52.

Ojog, S. (2024). Blockchain based DApps for education. *Informatica Economică, 28*(2), 43–52.

Sarajoti, P., Chatjuthamard, P., Papangkorn, S., & Phiromswad, P. (2023). *CSR Reporting and Blockchain Technology*. IntechOpen. https://doi.org/10.5772/intechopen.105512

Tapscott, D., & Tapscott, A. (2018). *Blockchain revolution: How the technology behind bitcoin is changing money, business, and the world*. Penguin.