# Leveraging Blockchain Technology to Revolutionise Corporate Social Responsibility: A Pathway to Enhanced Ethical Practices

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## Abstract

This paper investigates the potential of blockchain technology to enhance corporate social responsibility (CSR) by increasing transparency, trust, and operational efficiency. From its early developments in the 1970s to the pivotal introduction of Bitcoin in 2008, blockchain offers a decentralised, immutable framework ideal for CSR applications. The study reviews blockchain's architecture and key characteristics and examines CSR's multifaceted responsibilities and benefits. A literature review indicates blockchain can significantly improve supply chain transparency, CSR reporting accuracy, and sustainable business practices. Case studies in the fashion and agri-food industries illustrate practical applications. However, the study acknowledges challenges, including scalability, interoperability, integration complexity, and evolving regulatory landscapes. Future research should address these challenges, explore scalable blockchain solutions, and conduct empirical studies. This paper concludes that blockchain holds substantial promise for advancing CSR, fostering enhanced stakeholder engagement and ensuring authentic CSR activities.

## Keywords

corporate social responsibility, sustainability, blockchain, blockchain technology applications

## 1. Introduction

Information technology has provided a framework for solving many of humanity's problems for decades. Processes and activities in both business and private domains have been accelerated to enable people to lead more comfortable lives and enjoy increased leisure time. Although information technology offers numerous solutions, many aspects still require exploration, and the direction of its evolution cannot be predicted. This uncertainty encapsulates the dynamics of all professions within the IT industry.

Blockchain, as a new technology, is one such aspect that, despite its popularity, demands further investigation. The first indications of blockchain emerged in 1974 through Vinton Cerf and Robert Kahn's TCP/IP network protocol [1]). Development continued into the 1990s, culminating in 1996 when Nick Szabo introduced smart contracts [1]). The technology reached a significant milestone in 2008 with the pseudonymous Satoshi Nakamoto publication of the Bitcoin whitepaper [1]). The question is how blockchain, as a still-evolving technology, can contribute to corporate social responsibility, a growing area of business importance. According to the International Organization for Standardization (2021), ISO 26000:2010 guides social responsibility, helping businesses and organisations translate principles into effective actions and sharing best practices globally. Unlike other well-known ISO standards, it cannot be certified [2] but offers clarification on social responsibility applicable to all types of organisations, regardless of their activity, size, or location [3]. Launched in 2010 after five years of negotiations involving various global stakeholders, ISO 26000 represents an international consensus [3].

Companies increasingly strive to embrace social responsibility and contribute positively to the environment. The "100 Best Corporate Citizens" list for 2023 highlights the top companies in this area, with Hewlett Packard Enterprise Company, Accenture Plc, HP Inc., Hasbro, Inc., and The Estee Lauder Companies, Inc. occupying the top five positions [4]. General Motors won the Sustainability Leadership
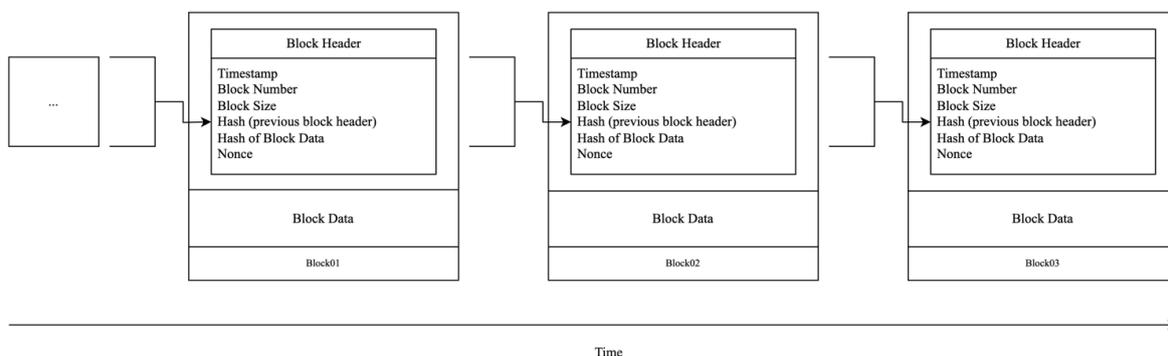
**Figure 1:** Generic Chain of Blocks (adapted from [7]).

The primary research question, therefore, is how blockchain technology can be applied to enhance corporate social responsibility. Exploring this intersection could yield significant benefits, leveraging the strengths of blockchain to address and improve CSR efforts, ensuring transparent, immutable, and efficient practices in the corporate world.

Following an introduction that provides insights into blockchain and corporate social responsibility, the remainder of the paper is structured as follows. The second chapter, Theoretical Foundations, explores the available literature and related research on blockchain technology and corporate social responsibility. The third chapter reviews the applications of blockchain in corporate social responsibility. The paper concludes with a summary.

## 2. The Theoretical Foundations

Blockchain, as the name suggests, denotes a chain of blocks, where blocks represent and contain data, and the chain refers to how the blocks are interconnected [6]. Figure 1 illustrates the blocks' content, consisting of a block header and data. The block header contains data such as the timestamp, block number, block size, hash of the previous block header, hash of the block data, and a cryptographic nonce - an arbitrary number, while the block data consists of various other data, usually a list of transactions [7, 8]. Moreover, the blocks are connected cryptographically, which means that asymmetric private keys are used to prevent the chains from being breached and to make hacking the system impossible [9].

Blockchain technology has numerous characteristics that place it at the forefront of today's technologies. According to [10], Table 1 provides an overview.

Before explaining how blockchain works in an example, Fig. 2 presents the architecture of blockchain in three layers. The first layer visible in the figure below belongs to the application layer, which includes the wallet and is the layer through which end users execute their transactions. The second layer pertains to the decentralised ledger, which is responsible for grouping transactions, also known as mining. The final third layer is the peer-to-peer network, where node types play different roles, and various messages are exchanged to maintain the decentralised ledger.

The functioning of blockchain will now be explained using the example in Fig. 3. Suppose person A intends to send one Bitcoin (one of the cryptocurrencies) to person B. The first step is initiating this transaction, represented as a block with the structure described above in the second step. In the third step, this block, or the newly created transaction, is broadcast to all participants in the network. Per [12], nodes are individual computers within the blockchain network that validate and relay transactions. If all nodes validate this transaction (noting that the transaction can be rejected), this block will be

**Table 1**
Blockchain Characteristics (adapted from [10]).

| Characteristic | Description |
| --- | --- |
| Anonymity | Users can generate addresses that do not reveal their real identities. |
| Auditability | Easy verification of transactions: Bitcoin uses UTXO (an unspent transaction output) to track transaction history. |
| Coherence | All participants see the same version of the distributed ledger. |
| Consensus | All nodes must agree on the validity of a transaction. |
| Decentralisation | There is no need for a central authority; consensus algorithms maintain network integrity. |
| Distributed | Peer-to-peer network with no single point of failure; network functions despite node failures. |
| Immutability | Transactions cannot be tampered with; errors require new transactions to correct them. |
| Persistency | Transactions are quickly verified and difficult to reverse or erase once recorded. |
| Provenance | Participants can trace the lineage of any asset on the blockchain. |

appended to the chain of previous blocks. Adding a block to the chain, known as mining, involves nodes solving complex cryptographic puzzles to confirm and secure the transactions [13, 10]. In the final step, the transaction is executed, and the Bitcoin is transferred from person A to person B.

Although there are numerous divisions, the paper will focus on one that occurs in all variants and represents the core differentiation of blockchain. This division distinguishes four blockchains: public, private, permissionless, and permissioned. A public blockchain is open to everyone; anyone can join, whereas in private blockchains, entry is controlled by membership and such blockchains are restricted and limited to business networks [15]. In permissionless blockchains, there are no constraints placed on participants, but in contrast, permissioned blockchains are confined to a specific group of users who are assigned identities through certificate issuance [8, 16].

Corporate social responsibility (CSR) represents a comprehensive framework that integrates a variety of activities and duties within a corporate context. It is characterised by the voluntary adoption of environmental and social goals in a company's stakeholder interactions and operational practices, as described by Barbieri da Rosa [17]. This framework is dedicated to equitable growth and sustainable development, as Fatima & Elbanna [18] highlighted and acknowledged the corporation's role within broader societal networks [19]. CSR entails that a company remains socially accountable to itself, its stakeholders, and the public, extending beyond its legal, ethical, and financial duties [20]. CSR can manifest in numerous forms, from philanthropic endeavours to strategic initiatives designed to align business operations with broader societal goals. This may include efforts to reduce environmental impact through sustainable resource management, initiatives to promote social equity within the workplace and the wider community and the adoption of transparent governance practices to build trust and accountability [21, 22]. Sustainability, accountability, and transparency are central to CSR, guiding companies to create value for shareholders and society [19]. Gordon Fitch's [23] definition of corporate social responsibility encapsulates its essence: "Corporate social responsibility is defined as the serious attempt to solve social problems caused wholly or in part by the corporation." This definition underscores corporations' critical role in addressing societal challenges and emphasises the importance of proactive engagement in social problem-solving. In conclusion, CSR is not merely a set of add-on activities but a fundamental approach to conducting business that recognises the interconnectedness of economic, social and environmental factors.

CSR encompasses various responsibilities, including environmental, ethical, philanthropic, and financial obligations. Environmental responsibility extends beyond compliance with legal requirements, encompassing proactive measures such as exceeding regulatory standards and integrating environmental considerations into business operations and product development [20]. Ethical responsibility involves the firm's duty to society, stakeholders, and the environment, necessitating a balance between
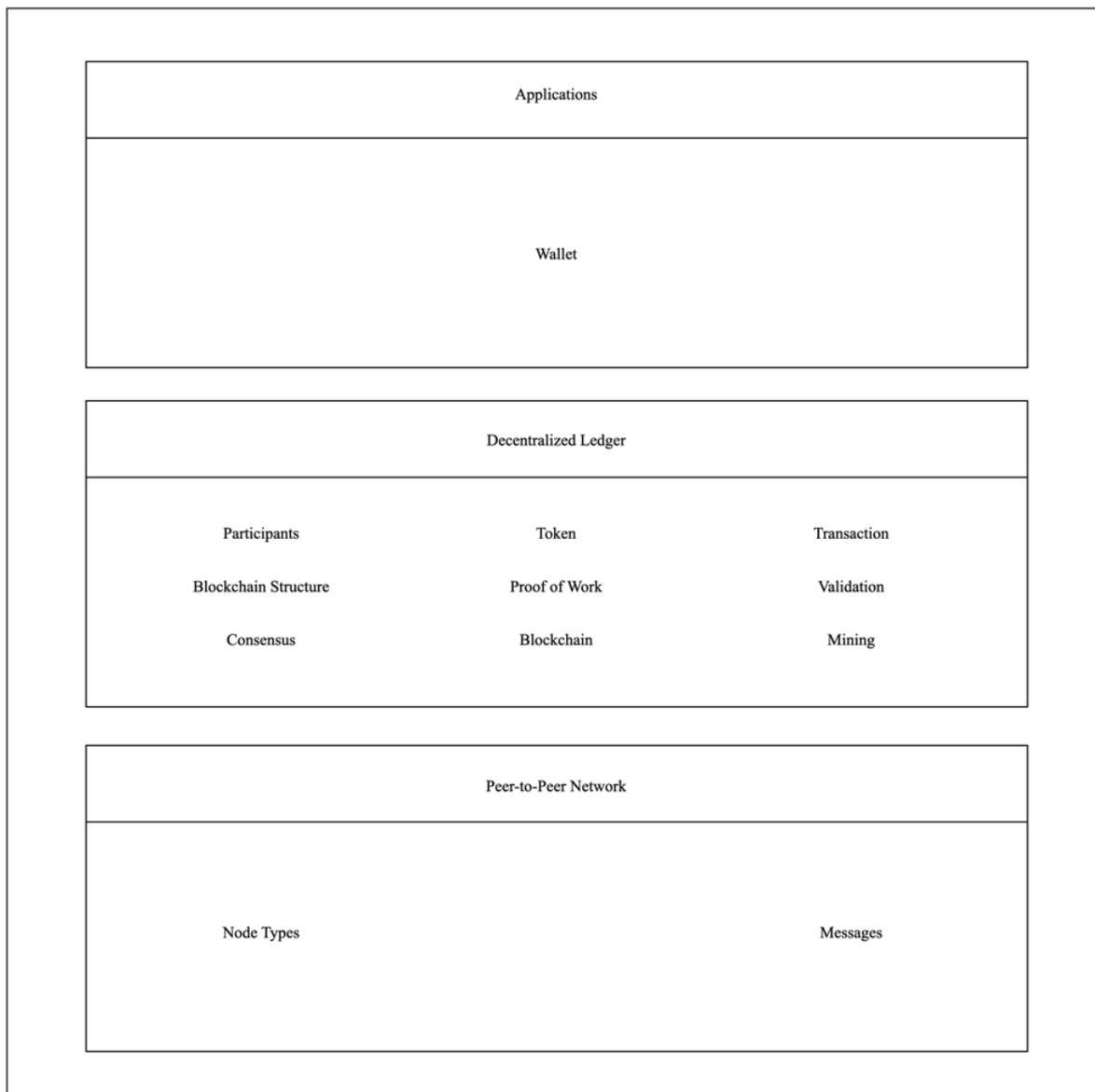
**Figure 2:** Blockchain Architecture (adapted from the author [11]).

immediate financial returns and long-term sustainable development [24]. Philanthropic responsibility refers to the voluntary initiatives firms undertake to benefit society, such as community development projects and charitable contributions [25, 26]). As an integral aspect of CSR, financial responsibility includes the firm's economic performance and integrating environmental, social, and governance (ESG) factors into financial decision-making processes [27, 28]. These diverse responsibilities are interconnected, forming the foundation for sustainable and ethical business practices. Environmental, ethical, philanthropic, and financial responsibilities are not isolated silos but rather interdependent elements that collectively contribute to a company's long-term viability and positive societal impact. By integrating these responsibilities, firms can navigate the complexities of modern business environments, fostering resilience and promoting a more equitable and sustainable global economy [29]. The holistic approach to CSR underscores the importance of aligning business strategies with broader societal goals, ensuring that companies achieve economic success and contribute meaningfully to social and environmental well-being. This comprehensive CSR perspective highlights businesses' evolving role in addressing global challenges and underscores the critical importance of responsible corporate conduct in today's interconnected world.
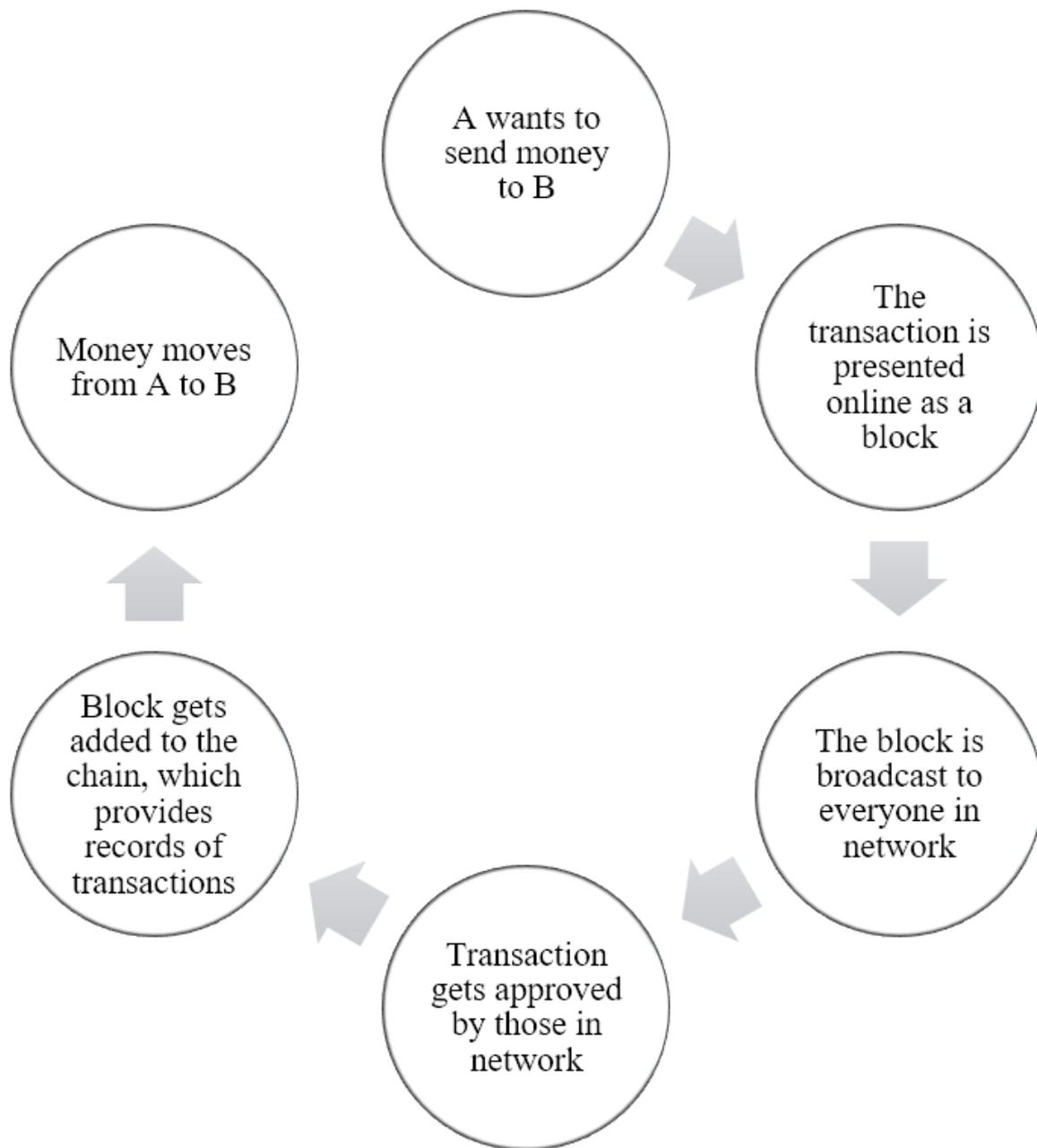
**Figure 3:** Transaction process (adapted from [14]).

CSR provides businesses with numerous advantages, including an enhanced reputation, increased customer loyalty and improved financial stability [30]. Additionally, CSR can elevate organisational performance, boost profitability and offer a competitive edge [31, 32, 33]. Ultimately, CSR is a strategic necessity that generates value, aligns businesses with societal expectations and fosters a healthier and more sustainable environment [34, 35]. By adopting CSR initiatives, companies can drive efficiency, particularly in non-competitive industries, while positively impacting the environment [36, 37].

## 3. Blockchain Application In Corporate Social Responsibility

The use of blockchain technology in the field of CSR provides a substantial opportunity to improve managerial practices by increasing transparency, trust, and operational efficiency. Managers face increasing pressure to develop sustainable business models and demonstrate the credibility of their CSR initiatives. Blockchain technology provides a decentralised and immutable platform for improving crucial operations such as supply chain transparency and CSR reporting accuracy.

From a managerial standpoint, blockchain technology builds confidence among stakeholders by providing verifiable and tamper-proof data, which is critical for establishing organisational legitimacy. It also enables managers to optimise operations, lowering administrative costs and expediting decision-making processes. Practical applications in the fashion and agri-food industries demonstrate how blockchain is used to assess product sustainability and assure ethical compliance. Nonetheless, managers face many obstacles, including technological scalability, system interoperability, integration complexity, and the need to react to changing regulatory environments. Purchasing scalable blockchain solutions and educating staff members to ensure successful implementation are two important suggestions for managers.

Studies highlight the growing necessity for transparency in supply chain governance to meet social sustainability goals. For instance, Venkatesh et al. in [38] emphasised the critical role of transparency in this domain, while Winkelmann et al. demonstrated that blockchain is the most widely used technology for sustainability within supply chains [39]. Ltifi and Mesfar [40] identified a positive correlation between blockchain-based CSR services and consumer attitudes and resilience. Similarly, Ronaghi and Mosakhani [41] confirmed that blockchain adoption positively impacts business ethics, corporate governance, and social sustainability.

In the following, Table 2 presents an overview of the studies, detailing the paper title, DOI, publication year, and a description of the main findings. For this research, the Web of Science database was searched using the query "corporate social responsibility" + "blockchain" in the topic field, which searches the title, abstract, and author keywords. The initial search yielded 36 studies. After reading the abstracts, those that did not align with the topic were excluded. Ultimately, the table contains 11 studies. This assessment of the literature provides scholars and managers alike with a basic understanding of blockchain's possibilities in CSR.

Table 2: List of papers contributing to the nexus of concepts CSR and blockchain (authors' work of the data collected from Web of Science)

| Paper Title | DOI | Year | Main Findings |
|---|---|---|---|
| Suppliers' Corporate Social Responsibility Efforts with Greenwashing Concerns: Can Blockchain Help? | https://doi.org/10.1016/j.ifacol.2022.09.690 | 2022 | The research demonstrates that blockchain technology can significantly enhance supply chain transparency, visibility, and traceability by linking CSR information nodes to the blockchain. This integration fosters consumer trust in CSR initiatives by ensuring the authenticity of disclosed information. However, the study also highlights the potential downside, as it may expose retailers to identification for irresponsible sourcing practices and incur higher penalty costs, rendering the impact of linking CSR information to blockchain a double-edged sword. Moreover, the adoption of blockchain encourages suppliers to adopt more responsible practices and intensify their CSR efforts, particularly when significant penalty costs are associated with violation detection. The findings suggest that blockchain adoption is especially beneficial for retailers in scenarios where the detection of violations is already efficient without blockchain and penalty costs are not prohibitively high. Thus, the research contributes valuable insights into the dual impact of blockchain on CSR and supply chain management, underscoring both the potential benefits and challenges. |
| Blockchain and the information-calculation problem | https://doi.org/10.1016/j.jebo.2023.07.007 | 2023 | The main findings of the research indicate that the lack of markets and pricing mechanisms presents significant challenges for rational economic decision-making, particularly in the realm of CSR programmes. The study suggests that information technology, especially blockchain technology, can address this issue effectively. Blockchain technology enhances a firm's CSR positioning by creating markets and pricing mechanisms where none previously existed, thus facilitating rational economic decision-making. It also reduces transaction costs and industrialises trust, which are crucial for emerging new markets. The research highlights specific approaches and examples, including supply chain transparency (e.g., De Beers' 'Tracr'), environmental sustainability (e.g., Energy Web Chain), incentivising recycling (e.g., Plastic Bank), resource distribution (e.g., World Food Programme's Building Blocks), and tracking donations (e.g., Alice and Goodr). These initiatives exemplify how blockchain can improve the CSR positioning of companies by ensuring ethical sourcing, promoting the use of renewable energy, encouraging recycling, and providing transparency in resource allocation and donation tracking. |

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| An analysis of strategies for adopting blockchain in green supply chains under corporate social responsibility | https://doi.org/10.1007/s11356-023-27050-w | 2023 | This work indicates that blockchain technology supports firms' positioning in terms of CSR by enhancing transparency and trust within the green supply chain. This allows consumers to verify the environmental sustainability of products, thereby aligning with the goals of promoting social harmony, stability, and sustainable development. The findings suggest that firms with a strong awareness of CSR are more likely to adopt blockchain technology, utilising it as a strategic tool to demonstrate their commitment to CSR initiatives. |
| Exploring the Relationship Between Blockchain Technology and Corporate Social Responsibility Performance: Empirical Evidence from European Firms | https://doi.org/10.1007/s13132-022-00946-7 | 2023 | Blockchain technology supports a firm's positioning in terms of CSR by enhancing transparency and trust in transactions, improving the accuracy and efficiency of corporate practices, fostering innovation and providing technical support for better production processes and cost reduction. It also helps ensure that companies follow through on their CSR commitments, which can positively impact CSR performance, especially in the maturity stage of a company's lifecycle. Blockchain technology is particularly effective in solving social problems and improving employee and consumer satisfaction, which are key CSR aspects. |
| Corporate social responsibility (CSR) in fashion supply chains: A multi-methodological study | https://doi.org/10.1007/s13132-022-00946-7 | 2023 | Blockchain technology supports a firm's positioning in terms of CSR by enhancing transparency and trust in transactions, improving the accuracy and efficiency of corporate practices, fostering innovation and providing technical support for better production processes and cost reduction. It also helps ensure that companies follow through on their CSR commitments, which can positively impact CSR performance, especially in the maturity stage of a company's lifecycle. Blockchain technology is particularly effective in solving social problems and improving employee and consumer satisfaction, which are key CSR aspects. |

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| Corporate social responsibility (CSR) in fashion supply chains: A multi-methodological study | https://doi.org/10.1016/j.tre.2020.102063 | 2020 | Blockchain technology can improve information-sharing efficiency, thereby increasing the traceability and transparency of fashion supply chains. This, in turn, can improve the CSR reporting level, allowing firms to better communicate their CSR efforts to stakeholders. Real-world examples include luxury fashion brands like Louis Vuitton and Prada, which are planning to use blockchain to support product authenticity and address CSR and ethical sourcing matters. |
| Mobile time banking on blockchain system development for community elderly care | https://doi.org/10.1007/s12652-022-03780-6 | 2022 | The paper describes the use of blockchain technology in the mobile time-banking system on blockchain (MTBB) to foster better positioning of companies in terms of CSR by tracking and analysing volunteer activities for alignment with the Sustainable Development Goals (SDGs). The MTBB allows organisations to issue proprietary time tokens to volunteers, which can be used to access elderly care services. The immutable transaction records on the blockchain provide a reliable and transparent way to demonstrate the organisation's contributions to the SDGs. |
| Blockchain and sustainable supply chain management in developing countries | https://doi.org/10.1016/j.ijinfomgt.2021.102376 | 2021 | The paper includes examples such as Walmart's use of blockchain for food traceability, Coca-Cola's collaboration with the U.S. State Department to fight forced labour and Bext360's use of smart contracts to ensure fair payments to farmers. These approaches demonstrate a company's commitment to ethical practices, sustainability, and social responsibility, which can improve their CSR positioning. |
| The Impact of Instrumental Stakeholder Management on Blockchain Technology Adoption Behavior in Agri-Food Supply Chains | https://doi.org/10.3390/jrfm14120598 | 2021 | The paper discusses how a normative stakeholder management approach positively impacts blockchain technology adoption behaviour in the context of coffee and agri-food supply chains. It emphasises the importance of understanding how stakeholder management can compensate for the lack of consensus mechanisms in private and consortium blockchains, guiding the development of effective stakeholder management strategies. |

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| Blockchain and business ethics | https://doi.org/10.1111/beer.12259 | 2019 | Blockchain technology can foster better positioning of companies in terms of CSR by creating transparent supply chains. Companies like VeChain, Circulor, and IBM are examples of firms that have implemented blockchain to provide transparent supply chains for increased CSR. This approach allows for verifiable and immutable records of supply chain activities, enhancing the credibility of a company's CSR claims and ensuring that products are sourced from ethical and sustainable sources. |
| Investigating the Impact of Blockchain Technology on Social Sustainability and the Mediating Role of Ethics and CSR | https://doi.org/10.3390/su152115510 | 2023 | The adoption of blockchain technology and CSR in UAE banks enhances CSR and promotes ethical practices, transparency, stakeholder engagement, and social sustainability. Blockchain technology positively influences CSR by enhancing data security, transparency, and traceability, leading to improved CSR initiatives and benefiting organisations in the long term. The study confirms a significant positive effect of blockchain technology on CSR, with CSR mediating the relationship between blockchain technology and social sustainability. |
| Blockchain Technology in Life Cycle Assessment- New Research Trends | https://doi.org/10.3390/en14248292 | 2021 | The paper discusses how blockchain technology can support CSR activities by enhancing the effectiveness of Life Cycle Assessment in assessing environmental impacts, optimising production processes, reducing costs, and rationalising resource management. |

## 4. Conclusion

This study illustrates that blockchain technology offers substantial benefits for advancing corporate social responsibility (CSR) by promoting transparency, trust, and efficiency in various business processes. A detailed review of the literature and analysis of case studies shows that blockchain can significantly enhance the accuracy and reliability of CSR reporting, improve supply chain transparency and support sustainable business practices. The findings show that blockchain's immutable and decentralised nature ensures the authenticity of CSR activities, thereby fostering stakeholder engagement and trust. Key examples from the literature, such as the use of blockchain for supply chain transparency in the fashion industry and blockchain-based initiatives in agri-food supply chains, highlight this technology's practical applications and potential in CSR. These case studies demonstrate how blockchain can help company managers maintain ethical sourcing practices, ensure fair labour conditions, and enhance environmental sustainability.

Despite the promising potential of blockchain in CSR, this study acknowledges several limitations. Firstly, the primary data used in this research were sourced from the Web of Science database, which may not comprehensively cover all relevant studies and insights on the topic. This limitation highlights the need for a more extensive database search in future research. Additionally, the adoption of blockchain technology is still in its early stages, and significant technical challenges related to scalability and interoperability need to be addressed. Integrating blockchain into existing corporate infrastructures can also be complex and costly, posing a barrier to widespread adoption. Furthermore, the regulatory environment for blockchain technology is still evolving, creating uncertainties for companies seeking to implement blockchain-based CSR initiatives.

Future research should focus on overcoming the technical and regulatory challenges associated with blockchain adoption in CSR. Exploring scalable and interoperable blockchain solutions will be crucial for broader implementation. It would also be valuable to conduct empirical studies focusing on the Serbian region, examining how companies integrate blockchain technology into their CSR efforts. Investigating the specific challenges and opportunities faced by Serbian companies in this context can provide deeper insights and practical recommendations. Longitudinal studies tracking the impact of blockchain on CSR performance over time would also be beneficial, providing a clearer picture of its effectiveness and sustainability. By addressing these areas, future research can contribute to the development of robust frameworks for integrating blockchain into CSR practices, ensuring that its benefits are fully realised for both businesses and society.

## Declaration on Generative AI

The authors have not employed any Generative AI tools.

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