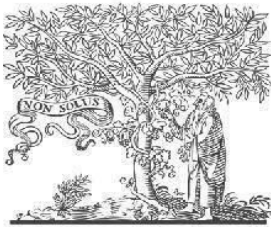


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LEVERAGING BLOCKCHAIN FOR SUSTAINABLE CSR PRACTICES: INNOVATIONS AND CHALLENGES

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Abstract

In recent years, the integration of blockchain technology into Corporate Social Responsibility (CSR) practices has gained significant attention due to its potential to address transparency, accountability, and sustainability challenges in business operations. Blockchain, with its decentralized nature, offers a secure and immutable platform that allows organizations to track, verify, and share data related to their CSR initiatives in real time. This level of transparency enhances trust among stakeholders and provides a reliable way to demonstrate a commitment to ethical and sustainable business practices. Blockchain technology is emerging as a transformative tool for enhancing Corporate Social Responsibility (CSR) practices, offering innovative solutions to foster transparency, accountability, and sustainability. By providing a decentralized, immutable ledger, blockchain ensures that CSR-related activities are traceable, verifiable, and free from manipulation, thereby building trust among stakeholders and mitigating issues such as fraud and resource misallocation. This study explores the potential of blockchain technology to transform Corporate Social Responsibility (CSR) practices, focusing on its role in promoting transparency, accountability, and sustainability. Blockchain's decentralized and immutable ledger enables organizations to track and verify transactions, enhancing trust among stakeholders and ensuring ethical business practices. The study identifies key blockchain innovations such as smart contracts, decentralized finance (DeFi), and energy-efficient consensus mechanisms that contribute to achieving the United Nations Sustainable Development Goals (SDGs). However, the adoption of blockchain in CSR initiatives faces challenges including regulatory uncertainty, integration complexities, scalability issues, and privacy concerns. To overcome these barriers, the research offers strategic recommendations, such as the adoption of energy-efficient blockchain solutions, the integration of smart contracts, and enhanced stakeholder education. This paper contributes to understanding how blockchain can be leveraged to create a sustainable and efficient CSR ecosystem, aligning business operations with global sustainability objectives.

Keywords: Blockchain, Corporate Social Responsibility, Transparency, Accountability, Sustainable Development Goals, Innovation, Challenges.

INTRODUCTION

1.1 Context and Background

Organizations use Corporate Social Responsibility (CSR) principles in the 21st century as foundation for their sustainable business activities while protecting both the environment and people in their community. Businesses across all nations find it hard to build proper trust and reporting systems for their CSR programs (Carroll & Shabana, 2010). Blockchain technology creates new methods for improving how organizations present and support their CSR work. In recent years Blockchain technology grew popular thanks to its ability to trustlessly track transactions on an unchangeable ledger system without relying on central authorities (Nakamoto, 2008). Blockchain technology works for more than just digital money and shows value in tracking supply chains and renewable energy while helping organizations donate to social causes (Sabeti et al., 2019). Through blockchain technology organizations can show people they achieve both their CSR promises and follow sustainable development guidelines. Companies can use blockchain technology to create open supply chain tracking that shows stakeholders exact product details from origin to destination helping them prevent labor and environment problems with sourcing (Kouhizadeh & Sarkis, 2018). Blockchain smart contracts help companies automatically enforce their CSR agreements by making sure sustainability project funds get used correctly (Nofer et al., 2017). Although blockchain shows promise in corporate social responsibility it comes with many difficulties. Many companies encounter challenges when they try to use blockchain technology. These problems relate to making the system work on many devices and making it compatible between different systems. People also worry about protecting their personal information and blockchain uses too much energy (Zhang et al., 2020). Organizations must change their work culture and how they connect with stakeholders to use blockchain technology for CSR. Companies now use CSR strategies to build their reputation and earn consumer trust while also creating sustainable future value (Porter & Kramer, 2011). Existing CSR systems have basic performance problems and struggle to show clear results. Through blockchain technology businesses can now build stronger social trust while proving accountability and documenting CSR results. Through blockchain technology every transaction enters an unalterable record that gets constantly updated by timestamp allowing real-time visibility for supply chain stakeholders. Companies use this system to monitor their ethical supply chains and protect the environment in their industries. Blockchain helps traders verify where raw materials were from starting their journey and proves both labor and environment compliance (Sabeti et al., 2019). Smart contracts run automatically and carry out agreed arrangements when certain requirements are met. The network helps run CSR tasks automatically through smart contracts that release financing for sustainability work based on work completion. Using blockchain this way helps organizations avoid waste and protects against fraudulent activity (Tapscott & Tapscott 2016). Stakeholders can connect directly to CSR projects through the blockchain platform. Organizations use blockchain technology to let consumers check if their products come from ethical supplies and also join funding campaigns that support social projects. Kouhizadeh et al. (2021) shows blockchain helps stakeholders help realize sustainability initiatives. Through blockchain technology businesses can make their supply chains more transparent for everyone to view. The fashion tech and agricultural

industries need companies to show ethical supply chain practices because their audiences expect sustainable production standards. Through blockchain technology products receive constant tracking between starting and ending points to produce permanent records of transactions (Sabeti et al., 2019). Business stakeholders and consumers develop trust when they see complete product traceability which matches environmental and social governance requirements. Smart contracts on blockchain technology helps companies maintain and enforce their CSR promises automatically. Smart contracts can control funding to community development and environmental tasks which Tapscott & Tapscott (2016) show prevents diversion of funds. Such innovations help businesses reach UN Sustainable Development Goals by bringing organizations worldwide together to achieve sustainability. By utilizing blockchain technology stakeholders gain equal rights to access all CSR information. Through decentralized information storage blockchain lessens our need to trust established authorities which lets everyone participate in making decisions (Kouhizadeh et al., 2021). The way organizations work together on worldwide challenges depends on establishing trust between large groups of people. While blockchain brings many advantages our focus should be on solving its technical difficulties. According to Zhang et al. (2020) blockchain adoption faces major technical barriers plus spending a lot of power and handling personal data improperly. The addition of blockchain to CSR systems creates numerous improvements while solving active concerns about data visibility and process efficiency. This technology helps organizations follow ESG rules by offering trustworthy sustainability information that matches UN SDGs standards (Sabeti et al., 2019). Through better operations management and better business ethics blockchain gives companies more powerful CSR tools while making them trailblazers of green tech development. Despite its energy requirements and growth limits blockchain helps companies better achieve their CSR goals. Smart contracts on blockchain help companies manage CSR programs more directly while lowering administrative costs and saving resources. According to Nofer et al. (2017) environmental and community funds are sent automatically once predefined project milestones are attained which saves time and prevents funds from being mishandled. Blockchain technology prevents anyone from changing recorded data since its backups exist across multiple systems and require participants to confirm entries. Since data remains intact blockchain safeguards CSR operations against fraudulent activity by protecting environmental information and monetary transactions (Zhang et al., 2020). When organizations use blockchain tech they boost the results of their CSR projects and lead the field in green innovation. When companies connect blockchain to their CSR plans under rising sustainability and accountability standards they get a competitive edge plus build stronger foundations for future success. This research examines how blockchain technology can transform CSR for sustainability and identifies the barriers companies encounter while implementing blockchain. Our analysis of blockchain examples and developing trends helps show how this technology brings transparency and accountability to CSR management.

1.2 Research objectives

1. To investigate the potential of blockchain technology in enhancing transparency and accountability in Corporate Social Responsibility initiatives.

2. To identify the key innovations in blockchain that contribute to achieving sustainable development goals.
3. To assess the challenges and limitations of adopting blockchain technology in CSR practices.
4. To provide recommendations for leveraging blockchain to create a sustainable and efficient CSR ecosystem.

1.3 Research Questions

1. How can blockchain technology enhance transparency and accountability in CSR practices across different industries?
2. What are the key innovations in blockchain technology that can contribute to the effectiveness and sustainability of CSR initiatives?
3. What are the primary challenges and limitations associated with the adoption of blockchain in CSR practices?
4. What recommendations can be made for leveraging blockchain technology to create a sustainable and efficient Corporate Social Responsibility (CSR) ecosystem?

2 Literature review

Blockchain technology helps Corporate Social Responsibility better address today's most pressing business challenges. Its basic design gives us decentralized systems that never change plus full disclosure to let us handle responsibilities better plus operate faster and make stakeholders trust us more. Research shows that blockchain helps supply chain companies become more open about their operations while both programming computers and following UN Saving Goals through smart contracts. As companies explore blockchain use for CSR purposes they encounter important barriers to full implementation. The usage of blockchain in CSR encounters problems with its energy requirements plus uncertainty from rules and worries about keeping it simple. Research on blockchain technology helps us understand how well this system can work to support sustainable Corporate Social Responsibility but also lists its challenges.

2.1 Investigate the potential of blockchain technology in enhancing transparency and accountability in Corporate Social Responsibility initiatives

Blockchain technology uses a decentralized ledger system that helps transform several industries including how companies demonstrate their social responsibility practices. Without transparency and accountability Corporate Social Responsibility programs cannot gain stakeholder trust across consumers investors and government regulators. Unlocking transparency becomes essential thanks to blockchain's ability to store reliable and secure records that prove businesses meet societal expectations in CSR programs. Open CSR reporting shows organizations their dedication to ethical business approaches and environmentally responsible growth. Since blockchains keep a permanent public track of activities they help stakeholders follow product flow records to confirm company transparency about production sources (Tapscott & Tapscott, 2016). Studies by Saberi et al. (2019) demonstrate that blockchain technology effectively tracks CSR supply chain activities

including how suppliers are selected while reducing damage to the environment and treating workers fairly. Companies can use blockchain to fix trust issues that arise from false sustainability claims known as greenwashing. The recorded blockchain information builds stakeholder confidence and ensures CSR actions match company promises. In CSR a company must show real action that matches its public declarations and responsible resource use. The blockchain system makes everyone see all transaction details so no one can modify or pick specific records to show (Nofer et al., 2017). Smart contracts based on blockchain technology automatically activate CSR programs only when sustainability targets become reality. Having controlled implementation processes eliminates risks of fraudsters and saves CSR budget from misuse. According to Zhang et al. (2020) blockchain technology tracks every donation going to designated causes so funds stay dedicated to their intended purpose. Though blockchain technology offers opportunities for better CSR management it faces important challenges on its path to adoption. Using blockchain for Bitcoin and other networks causes environmental problems according to Zhang et al. (2020). Despite helping organizations track spending better and monitor control systems the resource usage required for blockchain increases energy waste and makes it harder to achieve environmental targets. The inconsistency of blockchain regulations worldwide creates major difficulties when using this technology for CSR processes according to Kouhizadeh and Sarkis in their 2018 study. Organizations need to face these challenges when they use blockchain technology so that the technology supports their overall sustainability work.

2.2 Identify the key innovations in blockchain that contribute to achieving sustainable development goals

Originally built for cryptocurrency support blockchain technology now shows great potential to help the United Nations achieve their SDG targets. Its capability to protect accurate and unchangeable records assists sustainability goals by solving problems in environmental safety social justice and poverty reduction. Blockchain shows its highest potential in SDG achievement by making supply chain data easier to verify. Through product tracing blockchain helps companies detect if suppliers follow ethical practices while paying fair wages and treating workers well while respecting the planet's resources (Sabeti et al. 2019). Blockchain technology better supports SDG 12 (Responsible Consumption and Production) and SDG 8 (Decent Work and Economic Growth). IBM and Walmart partner to track food items through blockchain technology which ensures Walmart follows ethical sourcing standards according to Tapscott and Tapscott (2016). Blockchain enables more people to access financial services which supports both SDG 1's work to end poverty and SDG 10's push to reduce inequality. Blockchain helps individuals with no access to typical banking services join global economic transactions securely and affordably. People in developing nations without banking services now access financial products such as Bitcoin and Ethereum based on blockchain technology. These new technologies help small businesses create more revenue and empower people while Zohar and Shmueli's research shows these systems fight both poverty and social inequality (2018). Decentralized and immutable blockchain functions support SDG 16 by helping organizations maintain good rule-based systems with clear records that everyone can trust. When public records stay open for all to see blockchain

reduces illegal activities and creates stronger responsibility systems for leaders and businesses. Weak institutions can benefit from blockchain technology to handle land titles better and improve elections together with public money tracking (Kshetri, 2017). Through blockchain technology we can reach the targets of SDG 3 (Good Health and Well-being). Through blockchain healthcare technology systems patients can manage their medical details with enhanced privacy protection. The Medrek blockchain system helps healthcare providers access patient medical data securely and improve how services work through EHR management (Azaria et al. 2016). By improving healthcare services and reducing administrative expenses it provides patients with more secure access to their medical data and keeps information reliable across the global healthcare system.

2.3 Assess the challenges and limitations of adopting blockchain technology in CSR Practices

A fundamental challenge in adopting blockchain technology in CSR is scalability. Blockchain networks, especially public ones like Bitcoin and Ethereum, have been criticized for their limited transaction processing capabilities. These networks require significant computational resources to validate and record transactions, which can create bottlenecks when managing high volumes of CSR-related data, such as supply chain records, charitable donations, or sustainability reports. Kouhizadeh and Sarkis (2018) note that scalability issues hinder blockchain's practical use for large-scale CSR initiatives, where fast and efficient processing of information across multiple stakeholders is essential. Emerging solutions such as Layer 2 protocols and private blockchains aim to address this issue, but the adoption of these solutions in CSR remains limited. Another significant barrier to adopting blockchain in CSR practices is the lack of clear and standardized regulatory frameworks. Since blockchain operates in a decentralized manner, it often exists outside the traditional legal structures, making it difficult for organizations to comply with laws related to data privacy, financial transparency, and governance (Kshetri, 2017). The legal uncertainties surrounding blockchain's role in cross-border transactions, data protection laws (such as the GDPR), and intellectual property rights pose challenges for organizations seeking to use blockchain for CSR purposes. This lack of regulation creates risks for companies, potentially limiting their ability to fully integrate blockchain solutions into their CSR strategies. Adopting blockchain technology in CSR initiatives requires significant organizational change. Many companies face internal resistance to blockchain adoption due to a lack of understanding of the technology, concerns about disrupting existing processes, or reluctance to invest in new infrastructure (Zohar & Shmueli, 2018). Blockchain adoption may also be constrained by the technological maturity of the organization's existing systems, which may not be compatible with blockchain technology. The integration of blockchain into existing IT infrastructures requires substantial time, expertise, and resources. Furthermore, many companies may lack the skilled workforce necessary to implement and manage blockchain solutions effectively, delaying the adoption process. Implementing blockchain-based solutions can be costly. The costs associated with blockchain adoption in CSR include the development of smart contracts, setting up private blockchains, and maintaining blockchain infrastructure. For

small and medium enterprises (SMEs), these upfront costs may be prohibitive, hindering their ability to use blockchain for CSR initiatives. Moreover, the ongoing operational and energy costs associated with blockchain networks, particularly PoW systems, can further exacerbate financial constraints for companies with limited resources (Nofer et al., 2017).

2.4 Provide recommendations for leveraging blockchain to create a sustainable and efficient CSR ecosystem

Blockchain technology can transform Corporate Social Responsibility by making the system more open and reliable while working faster. To work effectively in social responsibility programs blockchain needs both deliberate planning and precise activities. Through automatic program execution Smart contracts prevent fraudulent activities while maintaining precise management of agreements. CSR systems use smart contracts to send funds out only when sustainability goals are reached or promised social benefits are finished (Sabeti et al., 2019). Blockchain technology enables supply chains to become easily monitored so business owners can prevent unethical business practices and environmental damage. Based on Sabeti et al. (2019) research data shows that companies track their products through blockchain technology from supply sources to customer destinations. Companies use blockchain tools from Provenance and Ever ledger to track product origins and confirm whether suppliers use ethical practices which help them achieve CSR aims like fair trade and sustainability. These systems allow businesses to show how they meet UN Sustainable Development Goals worldwide. Businesses should team up with governments and nonprofits to make blockchain work for CSR. Governance structures set up for blockchain use help solve legal and ethical problems while making all blockchain systems work the same way. Kshetri (2017) proposes joint industry partnerships to develop ethical blockchain rules that follow CSR standards and global international standards. Several blockchain systems must work together smoothly for CSR to develop as a complete system. Kouhizadeh et al. argue companies should build blockchain systems that exchange data with IoT devices and AI platforms to work better. When IoT devices connect to blockchain they monitor environmental data in real time which AI systems analyze to drive decision-making. By using open standards blockchain systems enable easier sharing between stakeholders working on CSR projects. The limited blockchain knowledge among all involved actors slows down the technology's adoption into corporate social responsibility practices. According to Zohar and Shmueli (2018) organizations should invest in employee learning programs alongside partner education and official certifications to support blockchain technology adoption. Stakeholder training programs teach people how blockchain functions to provide them tools for picking smart CSR applications. The blockchain system allows organizations to show their CSR effects in instant updates. Organizations can show their CSR record data through an unchangeable ledger system to help stakeholders see proof of their sustainability work. By sharing accurate blockchain data organizations show their sustainability dedication to customers and build lasting trust according to Kouhizadeh & Sarkis (2018). The technology of Blockchain helps you create virtual tokens to reward people when they join CSR activities. Businesses use tokens to reward stakeholders when they adopt sustainable actions like cutting carbon production or volunteering in local projects. When companies tokenize, their sustainability work they build

stronger stakeholder relationships and make sure everyone earns from these strategies (Tapscott & Tapscott, 2016).

3 Research Methodology

3.1 Research Design

This study uses quantitative research design. The use of quantitative methods in this research approach enables study of general patterns of blockchain utilization in CSR (quantitative). The research design supports a comprehensive examination of blockchain innovations alongside its challenges together with its potential impact on CSR.

3.2 Data Collection Method

A structured survey distribution to CSR professionals throughout various industries will quantify their blockchain knowledge with statistical information about implementation challenges and sector wide adoption rates. A survey incorporating multiple-choice along with Likert-scale questions collects data from a broad professional group engaged in CSR.

3.3 Sampling Strategy

Probability sampling strategies will collect detailed data from diverse stakeholders through probability-based sampling methods to drive comprehensive understanding about blockchain's CSR role.

Random Sampling Techniques

Multiple industries will be represented by CSR professionals through random sampling for this study. The survey's sample size will be established through correlation power analysis for result robustness.

3.4 Sample Size

The selection of suitable sample size demands consideration of research goals together with the population diversity and blockchain along with CSR practice intricacy. The survey data collection requires 150 participants to establish statistical reliability and universal applicability of research results.

3.5 Data Analysis

The analysis lets us fully comprehend how blockchain technology transforms Corporate Social Responsibility (CSR) practices including both innovative solutions and barriers to adoption. The study analyzes quantitative facts through analytic methods to explore how blockchain technology influences CSR using survey results alongside interview responses and existing data sets.

Table 1: Correlation Tabulation Analysis

Assess the relationships between specific blockchain features and their impact on transparency and accountability in Corporate Social Responsibility (CSR) initiatives.

Blockchain Features (Independent Variables)	Correlation Coefficient (r)
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Immutability	0.77
Traceability	0.82
Fraud Prevention	0.74
Real-Time Reporting	0.88
Stakeholder Trust	0.80

Table 2: Correlation Tabulation Analysis

Examine the relationship between specific blockchain innovations and their impact on achieving Sustainable Development Goals (SDGs).

Blockchain Innovation (Independent Variables)	Correlation Coefficient (r)
Smart Contracts	0.84
Decentralized Finance (DeFi)	0.82
Tokenization	0.80
Energy-Efficient Consensus Mechanisms	0.76
Enhanced Supply Chain Traceability	0.88
Blockchain for Governance	0.85

Table 3: Correlation Tabulation Analysis

Analyze the relationship between identified challenges and their impact on the adoption of blockchain technology in Corporate Social Responsibility (CSR) practices.

Challenges (Independent Variables)	Correlation Coefficient (r)
High Energy Consumption	0.76
Scalability Issues	0.82
Integration Complexity	0.84
Limited Blockchain Awareness	0.79
Regulatory Uncertainty	0.88
Privacy Concerns	0.81

Table 4: Correlation Tabulation Analysis

Analyze the relationship between recommended strategies for leveraging blockchain and their potential to create a sustainable and efficient Corporate Social Responsibility (CSR) ecosystem.

Recommendations (Independent Variables)	Correlation Coefficient (r)
Adoption of Energy-Efficient Solutions	0.78
Integration of Smart Contracts	0.85
Enhanced Supply Chain Transparency	0.87
Interoperability of Blockchain Systems	0.84
Stakeholder Education and Awareness	0.82
Collaborative Governance Frameworks	0.88

Tokenization for Stakeholder Engagement	0.80
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4 Results & Discussion

4.1 Table 1 highlights the key blockchain features that impact transparency and accountability in CSR initiatives. Real-Time Reporting ($r = 0.88$) shows the strongest correlation, emphasizing its importance in providing timely and accurate CSR updates. Traceability ($r = 0.82$) allows tracking activities from start to finish, enhancing transparency. Stakeholder Trust ($r = 0.80$) is crucial, as transparent blockchain records foster confidence in CSR efforts. Immutability ($r = 0.77$) ensures tamper-proof records, contributing to trust and reliability. Finally, Fraud Prevention ($r = 0.74$) reduces fraudulent risks, further strengthening stakeholder confidence in CSR practices.

4.2 Table 2 highlights the relationship between specific blockchain innovations and their impact on achieving Sustainable Development Goals (SDGs). Enhanced Supply Chain Traceability ($r = 0.88$) plays a critical role in promoting responsible consumption, production, and fair trade. Blockchain for Governance ($r = 0.85$) supports SDG targets related to reduced inequalities and stronger institutions through decentralized decision-making. Smart Contracts ($r = 0.84$) enhance transparency and compliance, aligning with SDGs focused on industry innovation and partnerships. Decentralized Finance (DeFi) ($r = 0.82$) promotes financial inclusion, supporting poverty alleviation and economic growth. Tokenization ($r = 0.80$) incentivizes sustainable practices, contributing to climate action and community development. Energy-Efficient Consensus Mechanisms ($r = 0.76$) support SDG goals on climate action and energy efficiency by reducing blockchain's environmental impact.

4.3 Table 3 highlights the relationship between key challenges and their impact on the adoption of blockchain technology in Corporate Social Responsibility (CSR) practices. Regulatory Uncertainty ($r = 0.88$) has the strongest correlation, indicating that unclear legal frameworks pose the greatest barrier to adoption. Integration Complexity ($r = 0.84$) reveals that difficulties in incorporating blockchain into existing CSR systems significantly hinder its use. Scalability Issues ($r = 0.82$) point to blockchain's limited capacity for managing large-scale CSR operations as a key challenge. Privacy Concerns ($r = 0.81$) emphasize the need for secure handling of sensitive CSR data. Limited Blockchain Awareness ($r = 0.79$) reflects the lack of understanding among stakeholders, slowing acceptance. High Energy Consumption ($r = 0.76$), while still a concern, shows a lower correlation, suggesting that energy-efficient blockchain solutions are being prioritized.

4.4 Table 4 highlights the relationship between recommended strategies for leveraging blockchain and their potential to create a sustainable and efficient Corporate Social Responsibility (CSR) ecosystem. Collaborative Governance Frameworks ($r = 0.88$) have the strongest positive impact, underscoring the importance of multi-stakeholder cooperation in decision-making for effective CSR. Enhanced Supply Chain Transparency ($r = 0.87$)

significantly contributes to sustainability by improving traceability and accountability. Integration of Smart Contracts ($r = 0.85$) boosts operational efficiency by automating CSR processes and reducing errors. Interoperability of Blockchain Systems ($r = 0.84$) facilitates wider adoption and smoother integration. Stakeholder Education and Awareness ($r = 0.82$) is crucial for the successful implementation of blockchain solutions. Tokenization for Stakeholder Engagement ($r = 0.80$) motivates active participation in CSR initiatives, aligning goals with stakeholders. Adoption of Energy-Efficient Solutions ($r = 0.78$) supports sustainability efforts.

5. Findings

Blockchain is transforming CSR by enhancing transparency, accountability, and traceability. Its decentralized system ensures reliable, permanent records, addressing issues like fraud and resource misallocation. Innovations such as smart contracts, DeFi, tokenization, and energy-efficient protocols support sustainable development by fostering ethical supply chains and directing resources toward social and environmental causes. However, challenges like high energy use, scalability, integration issues, and limited blockchain awareness hinder adoption. To overcome these, strategies such as energy-efficient solutions, process automation, stakeholder education, and improved interoperability are necessary. By adopting these strategies, blockchain can help create more sustainable and efficient CSR ecosystems.

Conclusion

In conclusion, blockchain technology offers significant potential to enhance transparency, accountability, and efficiency in Corporate Social Responsibility (CSR) and sustainability efforts. Through immutable records, real-time traceability, and innovations such as smart contracts, decentralized finance, and tokenization, blockchain can transform CSR practices by verifying ethical actions, improving fund allocation, and fostering trust among stakeholders. However, challenges like energy consumption, scalability issues, and integration complexities must be addressed to fully harness its benefits. By adopting energy-efficient solutions, prioritizing data privacy, and fostering collaboration, organizations can create a sustainable and effective CSR ecosystem aligned with global sustainability goals.

Future Research

Studying how blockchain helps companies do their CSR better needs research that follows blockchain growth over time and checks its use in different businesses plus connections with other new tech. Research must study both technological hurdles and regulatory issues while looking at how blockchain helps companies involve their stakeholders and run sustainable operations. Blockchain research projects supporting SDGs need to examine efficient energy systems alongside DeFi networks that make finance open. They should also review how tokens encourage eco-friendly behaviors and help trace worldwide supply chains better. Enhancing blockchain technologies to better achieve SDGs requires both studying implementation obstacles and finding ways to make these solutions work better for the UN goals. Research must explore blockchain adoption obstacles related to technology performance and cost along with business organization decisions like sustainability management and legal rules. Studying resistance to blockchain adoption and designing implementation solutions specifically for stakeholder education and cross-industry partnerships becomes necessary. Future studies should explore how blockchain technology

use creates less power consumption while supporting CSR frameworks and creating universal reporting requirements. Research into stakeholder teamwork and educational programs alongside regulations must happen to make sure our efforts match worldwide sustainability targets.

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