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## **LEVERAGING BLOCKCHAIN FOR ENHANCED SOCIAL AND ENVIRONMENTAL ACCOUNTABILITY: A CONCEPTUAL FRAMEWORK**

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### ABSTRACT

In an era characterised by unprecedented social justice and environmental sustainability challenges, there is a compelling need for innovative frameworks that foster accountability and transparency. The advent of blockchain technology offers a transformative potential to address these pressing issues by enabling decentralised verification of transactions and activities. Unlike traditional systems, which often suffer from opacity and inefficiencies, blockchain provides an immutable ledger that can track the origins and journeys of products, thereby promoting ethical practices across supply chains. This paper explores the conceptual framework that leverages blockchain for enhanced social and environmental accountability, emphasising its capacity to empower stakeholders and facilitate responsible decision-making. By examining the intersection of technology with governance, this analysis posits that integrating blockchain can bolster accountability and restore public trust in institutions, ultimately contributing to a more equitable and sustainable future.

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## **1. Introduction**

In recent years, the global community has faced mounting challenges in ensuring transparency and accountability in social and environmental practices. Traditional accounting systems often fall short in delivering real-time, verifiable data, leading to concerns such as greenwashing and the misrepresentation of corporate social responsibility (CSR) efforts. These shortcomings erode public trust and impede progress toward achieving sustainable development goals. In response, blockchain technology has emerged as a promising solution, offering decentralised, tamper-proof ledgers that can significantly enhance transparency and accountability. By enabling the secure and immutable recording of transactions, blockchain allows for more reliable tracking of environmental impacts and social responsibility initiatives, thereby fostering greater trust among stakeholders (Garanina et al., 2022). For example, it can be utilised to monitor supply chains, ensuring that products are sourced sustainably and ethically. Furthermore, the transparency inherent in blockchain can support the verification of corporate claims related to environmental and social governance (ESG) metrics, reducing the risk of misinformation and fraud (Kaleido, 2024).

Nevertheless, the integration of blockchain into social and environmental accounting is not without its challenges. One major concern is the environmental impact of blockchain technology itself, particularly the high energy consumption associated with certain consensus mechanisms such as proof-of-work. A study by the United Nations University (2023) underscores this issue by highlighting the significant carbon footprint of Bitcoin mining, thereby emphasising the need for more sustainable blockchain alternatives. Despite these environmental concerns, the potential benefits of blockchain in advancing transparency and accountability remain substantial. By offering an immutable and transparent record of transactions, blockchain can help rebuild public trust in corporate practices, encourage ethical behaviour, and support broader sustainability goals. Therefore, investigating blockchain's role in enhancing social and environmental accounting is both timely and crucial.

In the Malaysian context, the adoption of blockchain technology within accounting practices is gradually gaining traction, particularly concerning social and environmental accountability. A bibliometric analysis of blockchain research in Malaysia reveals a growing interest across various sectors, such as finance and supply chain management. However, its specific application in social and environmental accounting remains underexplored, thus presenting significant opportunities for further research and practical implementation (Bazel et al., 2023). Emerging studies suggest that blockchain can enhance the credibility and accuracy of financial information in Malaysia's accounting sector. By ensuring transparency and immutability, it has the potential to strengthen financial reporting and auditing processes, which are critical for robust social and environmental accountability.

Moreover, the Malaysian government has demonstrated a strong commitment to digital innovation and sustainability through various national policies and corporate ESG initiatives. The integration of blockchain technology aligns with these efforts by providing a solid framework to support sustainable development goals through transparent and accountable reporting mechanisms (Al-Ashmori et al., 2023). Despite these positive developments, several barriers hinder the widespread adoption of blockchain in Malaysia, including issues related to technological readiness, regulatory frameworks, and organisational capacity. Addressing these challenges is essential to fully capitalise on blockchain's potential in transforming social and environmental accounting and accountability practices. As such, realising the full benefits of blockchain will require coordinated action from both the public and private sectors.

To address these gaps, this study proposes a conceptual framework that leverages blockchain technology to enhance social and environmental accountability, with a specific focus on Malaysia. The remainder of this article is organised as follows: Section 2 reviews the existing literature on blockchain technology in the context of accounting and sustainability. Section 3 outlines the research methodology. Section 4 introduces the proposed conceptual framework, detailing its components and underlying assumptions. Section 5 discusses the framework's implications and offers directions for future research. Finally, Section 6 presents the conclusions of the study.

## **2. Literature Review**

### **2.1 Overview of Blockchain Technology and Its Relevance to Social and Environmental Issues**

Blockchain technology, characterised by its decentralised and transparent nature, holds significant potential in addressing pressing social and environmental challenges. Through secure and immutable record-keeping, blockchain enhances the traceability of goods and services, enabling consumers to make more informed decisions about the sustainability of their purchases. For example, in supply chains, stakeholders can track product origins and verify adherence to ethical standards, fostering greater accountability. This functionality is particularly vital in sectors such as agriculture and textiles, where ethical sourcing is a major concern. Furthermore, blockchain has been shown to improve transparency in charitable giving by ensuring that donations reach their intended recipients. As highlighted by Novakovic et al. (2019), the adoption of blockchain could catalyse a shift towards more equitable and environmentally responsible practices. Ultimately, the convergence of blockchain technology with social and environmental accountability represents a frontier of innovation and exploration.

### **2.2 The Role of Blockchain in Promoting Transparency**

Building on its foundational attributes, blockchain technology has the capacity to enhance transparency and accountability across various sectors—critical elements in tackling social and environmental issues. By using decentralised ledgers, stakeholders gain access to real-time, tamper-proof data, thus fostering trust and improving oversight. The immutable nature of blockchain ensures that once information is recorded, it cannot be altered, which is crucial for applications such as monitoring supply chains and verifying ethical practices in industries like agriculture and manufacturing. Research supported by the Austrian Development Agency and conducted by the Research Institute for Crypto economics at the Vienna University of Economics and Business affirms that blockchain promotes operational transparency and aligns with the goals of sustainable development (Novakovic et al., 2019). Thus, blockchain emerges as a transformative tool that enables stakeholders to independently verify claims and actions, promoting greater accountability.

### **2.3 Mechanisms of Transparency in Supply Chains through Blockchain**

Extending the discussion on transparency, blockchain introduces transformative mechanisms within supply chains to bolster accountability. By employing decentralised ledger systems, all parties involved can access real-time transaction data, significantly reducing opportunities for fraud and unethical behaviour. Blockchain's immutable records enable end-to-end tracking of products from origin to final delivery, thereby supporting the verification of sustainable practices at each stage. This transparency not only facilitates compliance with environmental standards but also cultivates consumer trust, as individuals increasingly demand ethically sourced products. The Institute for Crypto economics underscores that such mechanisms

enhance both social and environmental accountability, driving corporate responsibility and reinforcing sustainability objectives (Novakovic et al., 2019). Consequently, blockchain-enabled supply chains not only mitigate risks associated with unethical practices but also align with global market demands for transparent operations.

## **2.4 Enhancing Stakeholder Engagement via Blockchain**

In addition to improving transparency, blockchain plays a pivotal role in enhancing stakeholder engagement in social and environmental governance. Its ability to provide immutable and transparent records reduces information asymmetry and supports more inclusive and informed stakeholder dialogue. The Integrated Assessment Model proposed by Pradana et al. (2023) underscores the importance of evaluating stakeholder dynamics and technology compatibility in blockchain implementation. Moreover, as Environmental, Social, and Governance (ESG) performance gains prominence, collaborative efforts enabled by blockchain can strengthen the effectiveness of ESG initiatives (Kabir et al., 2024). By granting stakeholders access to verifiable and timely data, blockchain fosters a culture of accountability and responsible corporate behaviour. This transformative engagement model contributes not only to sustainable practices but also to improved corporate transparency across sectors.

## **2.5 Facilitating Real-Time Data Sharing and Communication Among Stakeholders**

Another critical dimension of blockchain's utility lies in its capacity to facilitate real-time data sharing and communication among stakeholders. By ensuring the immediate availability of accurate and tamper-proof information related to resource sourcing, material recovery, and lifecycle management, blockchain enhances collaborative decision-making and regulatory compliance. Such transparency is increasingly important in meeting accountability standards and substantiating environmental impact reports (Brown, 2024). Moreover, blockchain's decentralised architecture reduces reliance on intermediaries and managerial oversight, thereby encouraging direct communication and innovation among stakeholders (Chartier-Rueg & Zweifel, 2017). These capabilities support more agile and responsive systems for managing social and environmental outcomes.

## **2.6 Previous Studies on Blockchain**

Recent scholarship has investigated blockchain's potential to resolve issues of transparency and accountability in various domains, including waqf (Islamic endowment) systems. Mohaiyadin et al. (2022) highlight how blockchain can enhance process integrity through public ledgers and decentralised networks. In the Malaysian accounting context, Lee et al. (2024) identify technological readiness and cost as critical factors influencing blockchain adoption.

Furthermore, bibliometric analyses (Sheela et al., 2023) and systematic literature reviews (Suta & Toth, 2023) suggest that blockchain can transform accounting and auditing practices by improving trust, efficiency, and the measurement of sustainability indicators such as greenhouse gas emissions. Almadadha (2024) further notes blockchain's role in supporting green finance and climate-related disclosures, while Chen et al. (2023) explore its utility in public sector budgeting reforms. Research by Giang et al. (2024) reinforces these findings, pointing to improved security, transparency, and reliability in business accounting practices.

Despite this growing body of literature, notable research gaps remain. Specifically, there is limited understanding of the regulatory and governance implications of blockchain in accounting, particularly regarding tax compliance, disclosure standards, and cryptocurrency-related

challenges (Sheela et al., 2023). Addressing these gaps is crucial for maximising the technology's potential in promoting social and environmental accountability.

To ground blockchain's impact within theoretical frameworks, several perspectives are noteworthy. Stakeholder Theory suggests that blockchain can align corporate actions with stakeholder interests by providing transparent, verifiable information. Legitimacy Theory posits that transparent and ethical reporting via blockchain can improve societal acceptance. Lastly, the Technology Acceptance Model (TAM) offers insights into organisational adoption behaviours, identifying barriers and facilitators that may influence blockchain implementation.

### **3. Methodology**

This study employs a narrative review method, which is ideal for synthesising existing literature to answer complex research issues and suggest conceptual frameworks (Green et al., 2006). Unlike systematic reviews, narrative reviews allow for a more in-depth investigation of various topics and theoretical viewpoints, allowing the researcher to combine insights from numerous fields. In this context, the narrative review approach is excellent for investigating the junction of Islamic marketing and digital consumption since it allows for the identification of essential principles, difficulties, possibilities, and ethical considerations while also revealing gaps in existing material. By combining findings from multiple studies, this strategy provides a thorough knowledge of how blockchain improves social and environmental accountability, ultimately guiding the construction of the suggested conceptual framework.

The narrative review process entails critically assessing and interpreting the chosen literature to find patterns, conflicts, and emerging trends. This approach allows for greater flexibility in arranging and presenting the material, ensuring that the review stays focused on the study's primary goal: offering a novel conceptual framework that elucidates the impact of blockchain on social and environmental accountability. The use of a variety of sources, ranging from scientific papers to case studies, ensures a complete approach while also strengthening the study's theoretical foundation.

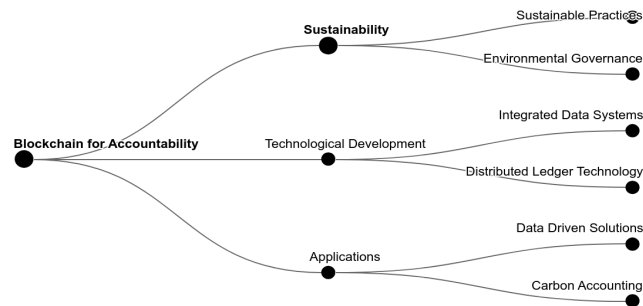
### **4. Conceptual Framework and Proposition Development**

Given the prior arguments, Figure 1 depicts the proposed Conceptual Framework of the study, which visually organises and categorises the major thematic areas where blockchain can contribute to social and environmental accountability. The figure illustrates the concept of "Blockchain for Accountability" as the central theme, emphasising how blockchain technology can enhance accountability across various domains. Three primary branches extend from this core idea: Sustainability, Technological Development, and Applications.

The Sustainability branch highlights blockchain's role in supporting sustainable development through two key components: *sustainable practices*, where blockchain enables transparency in supply chains to verify eco-friendly sourcing and production; and environmental governance, where it facilitates the monitoring and enforcement of environmental policies through immutable data records. Additionally, the Technological Development branch focuses on the foundational elements that make blockchain effective. This includes integrated data systems, which combine multiple data sources such as financial and environmental information into a unified framework, and distributed ledger technology, which underpins the decentralisation and tamper-proof nature of blockchain records.

Lastly, the Applications branch explores practical implementations of blockchain, including data-driven solutions for real-time, verifiable decision-making and carbon accounting, which uses

blockchain to accurately track, verify, and report carbon emissions and offsets. Overall, the figure categorises blockchain's potential for enhancing accountability across these three interconnected dimensions. By promoting sustainability, enabling technological innovation, and facilitating practical applications, blockchain emerges as a powerful tool for fostering trust, integrity, and traceability in both social and environmental governance contexts.



*Figure 1: Proposed Conceptual Framework*

#### **4.1 Blockchain for Accountability and Sustainability**

Blockchain technology serves as a powerful enabler of accountability in sustainability efforts, bridging the gap between transparency and measurable impact. At its core, blockchain operates as a decentralised and immutable ledger, ensuring that data recorded on the system cannot be altered or tampered with. This feature is particularly valuable for sustainability initiatives, where accountability is essential to verify claims of environmental and social responsibility. For instance, organisations can use blockchain to track carbon emissions, waste management practices, or renewable energy usage across their operations (Sharma et al., 2025). By providing an auditable trail of actions taken toward sustainability goals, blockchain ensures that stakeholders, ranging from consumers to regulators, can hold organizations accountable for their commitments.

In the context of sustainable finance, blockchain enhances accountability by creating transparent systems for recording and verifying eco-friendly investments. Green blockchain mechanisms, such as decentralised finance (DeFi) solutions, enable the issuance and tracking of financial instruments like green bonds or carbon credits, which are designed to fund environmentally beneficial projects (Irfan et al., 2025). Blockchain's ability to authenticate these transactions ensures that funds are allocated as intended and that their impact is measurable. This level of accountability not only builds trust among investors but also aligns financial systems with broader sustainability objectives, fostering a culture of responsibility and transparency in the allocation of resources.

Supply chain sustainability represents another critical area where blockchain strengthens accountability. Global supply chains often face challenges such as environmental degradation, unethical labour practices, and opaque sourcing methods. Blockchain addresses these issues by enabling end-to-end traceability, allowing stakeholders to verify the origins and conditions under which products are made (Munir et al., 2022). For example, blockchain can be used to track the journey of raw materials like cocoa or cotton, ensuring they are sourced sustainably and ethically. This transparency empowers consumers to make informed purchasing decisions and holds

companies accountable for their environmental and social practices, driving systemic change across industries.

Blockchain also plays a transformative role in sustainability reporting, improving the reliability and accountability of environmental, social, and governance (ESG) disclosures. Traditional ESG reporting is often criticised for lacking consistency and credibility, leading to scepticism among stakeholders. By leveraging blockchain, organisations can create tamper-proof records of their ESG metrics, ensuring that reported data is accurate and verifiable (Jamali et al., 2025). This fosters trust among investors, regulators, and the public, as they can independently validate the authenticity of sustainability claims. Enhanced accountability in sustainability reporting not only strengthens organisational credibility but also supports effective environmental and social governance.

Despite its potential, the integration of blockchain into sustainability practices faces several challenges, including high implementation costs, scalability limitations, and regulatory uncertainties (Cao & Foth, 2025; Vashishth et al., 2024). Addressing these barriers is crucial to unlocking blockchain's full potential in promoting social and environmental accountability. Nevertheless, real-world applications of blockchain in areas such as renewable energy, healthcare, and governance demonstrate its versatility as a tool for addressing global challenges. By leveraging blockchain to enhance transparency, traceability, and trust, organisations can take meaningful steps toward achieving sustainability goals while holding themselves accountable to their stakeholders. Blockchain technology enhances accountability in sustainability by providing transparent, immutable, and verifiable records across various domains, including supply chains, finance, and reporting. Its ability to ensure data integrity and foster trust makes it a powerful tool for addressing environmental and social challenges, despite existing barriers to adoption. Based on the literature reviewed and the conceptual frameworks discussed, it is evident that blockchain for accountability significantly influences sustainability. Therefore, the following proposition is developed:

*Proposition 1: Blockchain for Accountability positively influences Sustainability.*

#### **4.2 Blockchain for Accountability and Technological Development**

Blockchain technology has the potential to revolutionise accountability in technological development by leveraging its inherent features such as decentralisation, transparency, and secure data management. These attributes create a foundation for enhancing trust and responsibility across various sectors, particularly in areas requiring stringent oversight, such as supply chains, financial systems, and governance (Gadallah, 2023). For instance, blockchain can provide a secure digital infrastructure that ensures tamper-proof records of transactions, processes, and decisions. This capability is especially valuable in technological development, where accountability is critical to ensuring ethical practices, regulatory compliance, and equitable resource allocation. By enabling immutable and auditable records, blockchain fosters a culture of transparency and accountability, which is essential for sustainable innovation.

One of the keyways blockchain enhances social and environmental accountability in technological development is through its ability to facilitate traceability and verification. In industries such as manufacturing, agriculture, and energy, blockchain can track the lifecycle of products and resources, from raw material extraction to end-of-life disposal (Rizal Batubara et al., 2019). For example, blockchain can verify the sustainability credentials of materials used in technological products, ensuring they are sourced responsibly and produced in an environmentally friendly manner. Similarly, blockchain can monitor carbon emissions and energy consumption in data centres or manufacturing facilities, holding organisations accountable for

their environmental impact. By embedding accountability into technological processes, blockchain helps align innovations with global sustainability goals, fostering trust among stakeholders and promoting responsible development.

Blockchain also plays a pivotal role in enhancing accountability in financial aspects of technological development, particularly through mechanisms like smart contracts and decentralised finance (DeFi). Smart contracts, which are self-executing agreements coded on blockchain platforms, ensure that funds allocated for technological projects are disbursed only when predefined conditions are met (Nivodhini et al., 2024). This minimises the risk of mismanagement or corruption, thereby fostering accountability in project financing. Additionally, DeFi solutions enable transparent funding models, such as crowdfunding or tokenisation, which allow investors to track how their contributions are utilised in technological ventures. These applications of blockchain not only streamline financial processes but also promote ethical and accountable practices in the allocation of resources for technological innovation.

The decentralised nature of blockchain technology further strengthens accountability by enabling secure and transparent collaboration among multiple stakeholders in technological development. Whether it involves researchers, engineers, policymakers, or investors, blockchain provides a shared platform where all participants can access and verify data related to joint projects (Srivastava & Selvanambi, 2023). For instance, in collaborative research initiatives, blockchain can document contributions from different parties, ensuring that intellectual property rights are respected and that credit is appropriately attributed. Similarly, in large-scale infrastructure projects, blockchain can track progress, expenditures, and compliance with safety standards, holding all parties accountable for their roles. By facilitating transparency and trust among stakeholders, blockchain supports more efficient and accountable technological development ecosystems.

Despite its transformative potential, the integration of blockchain into technological development faces several challenges, including non-technical issues, privacy concerns, interoperability, and governance dynamics (Rugeviciute & Mehrpouya, 2019). For example, while blockchain can handle small-scale transactions efficiently, its scalability for high-frequency operations remains a limitation. Additionally, integrating blockchain with existing systems and ensuring compatibility across platforms requires significant technological investment. Regulatory frameworks also need to evolve to address issues such as data privacy and legal enforceability of smart contracts. Real-world applications, such as the use of blockchain in Kenya to promote public accountability in governance (Ondiek & Onyango, 2024), demonstrate its versatility as a tool for driving accountability in technological development. By addressing these challenges, blockchain can play a pivotal role in shaping a future where technological advancements are aligned with principles of transparency, responsibility, and sustainability.

Blockchain technology enhances accountability in technological development by providing transparent, secure, and decentralised systems for tracking resources, processes, and financial transactions. Its applications in areas such as sustainability, project financing, and multi-stakeholder collaboration highlight its potential to drive ethical and responsible innovation, despite challenges like scalability, interoperability, and regulatory adaptation. Therefore, the following proposition is developed:

*Proposition 2: Blockchain for Accountability positively influences Technological Development*

### **4.3 Blockchain for Accountability and Applications**

Blockchain technology has emerged as a transformative tool for enhancing accountability across various applications, offering transparency, traceability, and trust in sectors ranging from public finance to healthcare. One of the most prominent applications is the tracking of public funds using blockchain, which ensures transparency and accountability throughout the allocation and utilisation process (Bhole et al., 2021). By recording every transaction on an immutable ledger, blockchain eliminates opportunities for mismanagement or corruption, enabling stakeholders to verify how funds are spent. This application is particularly valuable in government projects, where public trust is often eroded by opaque financial practices. Blockchain's ability to provide real-time visibility into fund flows fosters greater accountability and strengthens governance structures.

In the healthcare industry, blockchain offers innovative solutions to enhance accountability and transparency in critical areas such as revenue cycle administration, doctor credentialing, electronic health records (EHRs), and supply chain management (Qose et al., 2023). For instance, blockchain can securely store and share EHRs, ensuring that patient data is accurate, tamper-proof, and accessible only to authorised parties. Similarly, in supply chain administration, blockchain can track the provenance of pharmaceuticals, preventing counterfeit drugs from entering the market. These applications not only improve operational efficiency but also hold healthcare providers and suppliers accountable for maintaining ethical standards and regulatory compliance. By embedding accountability into healthcare processes, blockchain helps build trust among patients, providers, and regulators.

Blockchain's potential extends to multi-agent systems and collaborative processes through frameworks like the Diamond Accountability Model (DAM), which ensures security, accountability, and trust in decentralised environments (Kanak et al., 2020). Such models are particularly relevant in industries that rely on complex, multi-stakeholder interactions, such as manufacturing or logistics. By decentralising decision-making and providing a transparent record of actions, blockchain minimises the risk of disputes and ensures that all parties are held accountable for their contributions. Additionally, blockchain's governance attributes, such as automation and privacy protection, enable new models of collaboration that are both secure and efficient (Yue et al., 2021). These applications demonstrate how blockchain can transform traditional processes into more accountable and transparent systems.

The education sector is another area where blockchain can significantly enhance accountability. By leveraging blockchain, institutions can ensure the traceability, integrity, and verification of academic credentials while complying with regulations such as the General Data Protection Regulation (GDPR) (Delgado-Von-eitzen et al., 2021). This application addresses issues such as diploma fraud and unauthorised access to sensitive information, fostering trust among students, employers, and educational institutions. Furthermore, blockchain-based accounting and assurance systems can transform auditing practices by enabling real-time, verifiable, and transparent financial reporting (Dai & Vasarhelyi, 2017). These innovations reduce reliance on manual audits, minimise errors, and enhance accountability in financial disclosures.

Finally, blockchain's ability to manage citizens' data securely and transparently has far-reaching implications for government services and public administration (Piantari et al., 2024). Governments can use blockchain to store sensitive information such as identity records, tax payments, and voting histories, ensuring data integrity and accessibility while protecting citizens' privacy. This application not only enhances accountability in government operations but also empowers citizens by giving them greater control over their personal information. Despite its potential, challenges such as scalability, interoperability, and regulatory concerns need to be addressed for widespread

adoption. Nevertheless, these diverse applications highlight blockchain's versatility as a tool for driving accountability across multiple domains.

Blockchain technology enhances accountability across various applications by providing transparent, traceable, and tamper-proof systems. Its use cases in public funds tracking, healthcare, multi-agent systems, education, and government data management demonstrate its potential to transform traditional processes into more accountable and trustworthy systems, despite challenges like scalability and regulation. Therefore, the following proposition is developed:

*Proposition 3: Blockchain for Accountability positively influences Applications*

## **5. Discussion**

This conceptual framework explores the integration of blockchain technology to enhance social and environmental accountability. By leveraging blockchain's inherent features: transparency, immutability, and decentralisation, organisations can improve the traceability and reliability of sustainability practices. The framework examines how blockchain facilitates secure data sharing, thereby promoting corporate social responsibility (CSR) and ethical business conduct. The study also highlights the potential of blockchain to transform supply chain management by ensuring product authenticity and ethical sourcing. By adopting blockchain, organisations can foster greater stakeholder trust and contribute to the achievement of global sustainability goals.

The integration of blockchain technology into accountability frameworks offers a transformative approach to enhancing social and environmental governance. Key insights reveal that blockchain's decentralised nature facilitates real-time data transparency, fostering trust among stakeholders by providing immutable records of transactions and actions. This transparency not only aids in tracking compliance with social and environmental standards but also empowers consumers and investors with information about corporate practices. Future directions for blockchain in accountability should prioritise interoperability between different systems to maximise data sharing and analytics. Moreover, addressing challenges such as energy consumption and regulatory compliance is crucial for broader adoption. By harnessing the capabilities of smart contracts and decentralised applications, organisations can automate accountability processes, thereby reducing the potential for fraud and misreporting. Ultimately, the continued evolution of blockchain applications can redefine accountability standards, promoting ethical practices and sustainable development across various sectors.

Despite these advantages, research gaps remain. Concerns about blockchain's environmental footprint, particularly its energy consumption, require further exploration to align its use with sustainability goals. Additionally, the lack of standardised protocols and interoperability presents challenges for widespread adoption. Comprehensive regulatory and legal frameworks are also necessary to address issues like data privacy, security, and cross-border transactions. Finally, more empirical studies, including case studies and longitudinal analyses, are needed to assess blockchain's real-world effectiveness in improving social and environmental accountability. These research efforts will be essential to unlocking blockchain's full potential for sustainability and accountability. Furthermore, the challenges associated with the adoption of blockchain technology in various domains, including accounting, warrant further investigation (Putritama et al., 2024).

## **6. Conclusion**

In conclusion, leveraging blockchain technology within the framework of enhanced social and environmental accountability presents a transformative opportunity. Blockchain technology holds significant promise for advancing social and environmental accounting and accountability practices. Its capabilities in enhancing transparency, accuracy, and security align well with the objectives of these fields. However, addressing the identified research gaps is essential to fully harness its potential and ensure that its adoption contributes positively to sustainable and accountable business practices.

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