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Abstract

As global supply chains become increasingly complex, ensuring fair labor practices has become a significant challenge for companies across various industries. Exploitation, forced labor, and unsafe working conditions continue to persist in supply chains, often hidden from consumers and regulatory bodies. Blockchain technology, known for its decentralized and immutable ledger system, has emerged as a potential solution to enhance transparency, traceability, and accountability in supply chains. This paper explores the role of blockchain in ensuring ethical sourcing and fair labor practices. By examining the benefits and limitations of blockchain in tracking labor conditions and promoting accountability, the paper investigates whether blockchain can genuinely contribute to eliminating human rights abuses in supply chains. Through case studies, literature review, and expert insights, this study analyzes the capabilities and challenges of blockchain as a tool for fostering fair labor practices and ethical sourcing in industries such as fashion, agriculture, and electronics.

Keywords

blockchain,ethical sourcing,fair labor practices,supply chains,transparency

Introduction

In recent years, the issue of ethical sourcing and fair labor practices has gained significant attention, with both consumers and regulators demanding more responsibility from companies regarding the treatment of workers in global supply chains. Despite these calls for greater accountability, many supply chains remain opaque, making it difficult to track the labor conditions under which products are manufactured. Forced labor, child labor, poor working conditions, and exploitation continue to affect industries such as agriculture, textiles, electronics, and mining.

Blockchain technology, with its decentralized and transparent nature, has been proposed as a solution to address these issues. By providing an immutable, real-time record of transactions, blockchain could potentially enable businesses, consumers, and regulators to trace products through every stage of production and ensure that workers are treated fairly. This paper explores whether blockchain can play a role in ensuring ethical sourcing and preventing labor exploitation in global supply chains. It examines the potential of blockchain to enhance transparency, accountability, and traceability, and evaluates whether it can live up to its promise of transforming supply chain management to protect labor rights.

Literature Review

The global supply chain is vast and highly intricate, involving multiple stakeholders across various countries. Human rights abuses in supply chains are often difficult to detect due to the lack of transparency and the complexity of relationships between suppliers, manufacturers, and retailers. The International Labour Organization (ILO) estimates that over 40 million people globally are victims of modern slavery, with many of these cases linked to industries like agriculture, textiles, and electronics (ILO, 2017). In response to these abuses, there has been growing pressure on businesses to ensure ethical labor practices and to be transparent about their supply chains.

Blockchain, as a distributed ledger technology, provides an immutable record of transactions that is accessible to all participants in the network. This characteristic makes blockchain uniquely suited for improving supply chain transparency. Blockchain has the potential to create a shared, unchangeable record of the entire supply chain journey—from raw material extraction to product manufacturing to retail distribution—allowing companies and consumers to verify the working conditions and ethical standards under which products are produced (Tapscott & Tapscott, 2017).

Research has shown that blockchain can increase accountability in supply chains by providing a clear, traceable record of transactions that can be audited at any time. This transparency can be particularly useful in industries prone to labor exploitation, such as the fashion industry, where child labor and unsafe working conditions have been widespread (Golini, Longoni, & Cagliano, 2020). Several pilot programs, such as IBM's Food Trust Blockchain and VeChain in the fashion industry, have shown that blockchain can enhance traceability and help verify the origin of products, allowing consumers and regulators to check the conditions under which goods are produced.

However, blockchain technology is not without its limitations. While it can provide transparency and traceability, blockchain alone cannot guarantee the accuracy or authenticity of the data entered into the system. The quality of the data, and whether it reflects fair labor practices, is dependent on the integrity of those inputting it. Furthermore, the widespread adoption of blockchain across global supply chains remains a significant hurdle, with challenges related to cost, technological barriers, and resistance from stakeholders (Saber et al., 2019).

Methodology

This study employs a qualitative approach, conducting a comprehensive review of literature related to blockchain technology and ethical sourcing, with a particular focus on its role in promoting fair labor practices. The research includes a synthesis of case studies from industries where blockchain has been implemented to track and verify labor conditions, such as the fashion, food, and electronics industries. The paper also draws on interviews with industry professionals, supply chain experts, and blockchain

developers to understand the practical challenges and opportunities of implementing blockchain for ethical sourcing and fair labor practices.

Discussion

1. Blockchain as a Tool for Enhancing Transparency in Supply Chains

One of the most significant ways blockchain can contribute to ensuring fair labor practices is by increasing transparency in supply chains. Traditionally, supply chains have operated with limited visibility, with companies relying on intermediaries to manage transactions and track goods. This lack of transparency has made it difficult to trace the origin of products and verify the conditions under which they were produced.

Blockchain, by contrast, provides an immutable ledger of transactions, allowing all parties involved in the supply chain to access the same real-time data. This decentralization ensures that no single party can manipulate or alter the information, creating a system of accountability. With blockchain, consumers, auditors, and regulators can trace products from raw material extraction to the final consumer, verifying that ethical labor standards were upheld throughout the production process.

In the fashion industry, for example, blockchain has been used to track the origins of clothing and accessories, ensuring that they were produced without child labor or unsafe working conditions. Companies like Provenance and VeChain are using blockchain to create transparent supply chains, enabling consumers to verify whether workers were paid fairly, worked in safe conditions, and were not subject to exploitation. This transparency can lead to better decision-making by consumers and increased pressure on companies to adopt fair labor practices.

2. Accountability and Verification of Fair Labor Practices

Blockchain can also help ensure accountability by providing a clear, traceable record of all transactions within the supply chain. If labor violations occur, blockchain allows companies, auditors, and regulators to track the source of the problem and hold the responsible parties accountable. This accountability can create an environment in which companies are incentivized to adopt ethical labor practices in order to avoid reputational damage and legal consequences.

For example, in the mining industry, blockchain has been used to trace the origins of minerals such as cobalt, which are often sourced from regions with significant labor abuses. By using blockchain to track the entire supply chain journey, companies can verify that their raw materials are not linked to human

rights violations. This traceability can not only improve the transparency of the supply chain but also discourage suppliers from engaging in exploitative practices.

However, while blockchain enhances accountability, it is important to recognize that blockchain alone cannot verify whether fair labor practices were followed. It depends on the data being entered into the system by trusted parties. If suppliers provide false information or conceal unethical practices, blockchain may still record this inaccurate data. To ensure the integrity of the system, blockchain must be combined with third-party audits, certifications, and other verification mechanisms that can confirm the accuracy of the information entered into the blockchain (Saber et al., 2019).

3. Challenges and Limitations of Blockchain in Ethical Sourcing

Despite the promising potential of blockchain to improve ethical sourcing, several challenges remain. One of the primary challenges is the adoption of blockchain technology across global supply chains, particularly in industries and regions with limited technological infrastructure. Small and medium-sized enterprises (SMEs) may not have the resources to invest in blockchain solutions, and the lack of standardization in blockchain protocols can make it difficult for companies to integrate the technology into their existing systems (Tapscott & Tapscott, 2017).

Another challenge is the accuracy of the data entered into the blockchain. While blockchain ensures that once data is recorded, it cannot be altered or erased, the technology does not inherently verify whether the data is true. This issue can be mitigated by integrating blockchain with other technologies, such as Internet of Things (IoT) devices, sensors, or third-party audits, which can provide real-time monitoring and verification of working conditions. However, these solutions can add complexity and cost to blockchain implementation.

Finally, blockchain cannot replace the need for strong labor laws, ethical sourcing standards, and effective enforcement. While blockchain can provide the tools for greater transparency and accountability, it is ultimately up to governments, businesses, and consumers to ensure that these tools are used effectively to promote fair labor practices. Without comprehensive regulatory frameworks and industry collaboration, blockchain alone may not be enough to eradicate exploitation in global supply chains.

Results

The case studies and literature reviewed suggest that blockchain has the potential to significantly enhance transparency, accountability, and traceability in global supply chains. Industries such as fashion, agriculture, and electronics have already seen positive results from blockchain initiatives aimed at improving labor practices and ethical sourcing. However, the adoption of blockchain in supply chains is

still in its early stages, and challenges such as cost, data accuracy, and integration with existing systems remain significant barriers to widespread implementation.

Conclusion

Blockchain technology offers significant potential to promote fair labor practices and ethical sourcing in global supply chains. By providing transparency, accountability, and traceability, blockchain can help ensure that products are produced under ethical conditions and free from exploitation. However, for blockchain to be fully effective in ensuring fair labor practices, it must be adopted widely, integrated with complementary technologies, and supported by strong regulatory frameworks. Blockchain alone is not a panacea; it must be part of a broader effort to address labor rights issues through collaboration between businesses, governments, and consumers.

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