Blockchain and Human Rights: Ensuring Accountability in Supply Chains

Noor Al-Naseri, Global Head of Governance and Compliance, FNZ

Abstract

The integration of blockchain technology into global supply chains offers transformative potential for promoting human rights and ensuring accountability. By leveraging its core features—transparency, immutability, and automation—blockchain can create verifiable and tamper-proof records of transactions, enabling real-time traceability and enhanced oversight of ethical practices. This paper explores how blockchain facilitates compliance with labor standards, mitigates fraud, and enforces human rights obligations through mechanisms such as smart contracts and decentralized governance structures. Case studies, including applications in the diamond and agricultural sectors, highlight blockchain's role in addressing critical issues like forced labor, wage theft, and unsafe working conditions. However, challenges such as regulatory ambiguity, data privacy concerns, and the digital divide underscore the need for robust governance frameworks and global cooperation. By examining these challenges and proposing actionable solutions, this article underscores blockchain's potential to redefine accountability in supply chains while advocating for inclusive and sustainable adoption strategies.

Introduction

Poverty also goes hand in hand with child exploitation, both occurring under dire environments. The advent of globalization has not only brought us many avenues for economic growth but has also forged new paths for egregious exploitation. The establishment of standardized supply chains has led to the smart exporting and importing of goods globally, which may have created market efficiency, but at a great cost to human life. The United Nations has published numerous documents on Business and Human Rights (UNGPs) and

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

Economic Rights conventions facilitated by ILO, however, these problems remain challenges to date.

Now imagine a world where there is a legal framework that enables real-time tracking capability of goods without relying on organizations. Imagine a future where accountability and source verification are solved through a single software rather than traditional channels, that future is possible with blockchain technology. This highlights a major advantage of implementing blockchain technology - its application as a general framing tool for business and politics allowing to emphasize and establish better framework compliance with society's ethical and legal expectations.

This paper investigates blockchain's functions in the context of human rights in supply chains and offers an analysis of the technology, its barriers and its characteristic features, as well as its real-life implementations. Furthermore, some potential positive consequences of the technology are considered, including economic, social, ethical, based on the presented cases and current developments.

As with other technologies, these practices are also subject to widespread abuse; for example, the definition of supply chains has expanded to the point where human rights violations are possible.

More often than not, the entire world works together to set up Supply Chains consisting of components of patents, raw materials, intermediate goods, and procedures. Due to its size and structure, the multinational structure allows for greater cost savings and greater scalability to large corporations. In today's supply chains, large corporations delegate production to subcontractors, who then deal with smaller companies that have little monitoring. Speaking of structures like this, the ability to engage in ethical practices and respect human rights is intricately complicated.

The scale of violation of Human Rights in Supply Chains is appalling.

According to reports, 21% of the global population remains in modern slavery, with over 28 million among them having no means of escaping while many helplessly toil in supply chains of products like electronics or garments and agricultural goods. Particularly, in electronic

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

fabrications, apparel, and agricultural products, many people are made to work against their will and ability and are often vulnerable to exploitation.

This exploitation of child labor is in the production of batteries, the materials for which are cobalt, has been investigated in the DRC abuse of child labor for cobalt mining. Child workers often suffer injuries, and parents fail to provide enough protection for these youngsters, leading to traumatizing conditions.

- One of the disadvantages of the fashion industry is found in the garment workers particularly in countries such as Bangladesh and India who receive low pay, work for long hours and in areas that are not safe.
- The fishing industry has previously been accorded a human rights by the international organizations in regards to forced labor, particularly in Southeast Asiaissuing of irregularity wherein workers are treated inhumanely whilst on board the vessels.

Limitations of Traditional Monitoring Mechanisms

Using such approaches as audits and certifications has not been effective in addressing these issues. As we know audit results are often based on vendors' self-reported documents, which can always be fabricated. Likewise, there is inconsistency of enforcement actions across borders which creates loopholes in regulation that bad actors take advantage of. For instance, a particular nation may have improved human rights policies…however, neighboring countries could be weak, which would allow suppliers to shift operations and avoid being held responsible.

It is not just clear that they requires an overcoming of the bare liabilities of improving upon people being accountable, it is also obvious that they requires improving upon the bare liabilities towards the surveillance of processes, materials and information. In this respect, the last example – supporting the development of blockchain technology seems to be the right move.

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

Challenges to Implementing Blockchain in Supply Chains

While blockchain offers transformative potential, its implementation is not without challenges. These obstacles must be addressed to realize its full benefits.

Technical and Financial Barriers

Implementing blockchain requires significant investment in technology, infrastructure, and expertise. Smaller suppliers, particularly those in developing countries, may lack the resources to participate in blockchain-enabled supply chains. This raises concerns about marginalization, as these stakeholders risk being excluded from global markets (Casino, Dasaklis & Patsakis, 2019).

Data Accuracy and Verification

Blockchain ensures the immutability of data but does not guarantee its accuracy. If false information is entered at the source, the blockchain will preserve the falsehood. This underscores the need for robust mechanisms to verify data at the point of entry, such as third-party audits or IoT devices that capture real-time information.

Privacy and Competitive Concerns

Blockchain's transparency could expose sensitive business information, such as supplier identities and pricing structures. Companies must balance transparency with confidentiality to protect their competitive advantage while ensuring accountability (Zheng et al., 2017).

Regulatory and Legal Hurdles

The global nature of supply chains means that blockchain implementations must navigate varying legal frameworks. For example, data privacy regulations like the General Data Protection Regulation (GDPR) in the EU may conflict with blockchain's transparency, complicating compliance (Finck, 2018).

Blockchain Technology: A Response to Human Rights Violations

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

Blockchain technology allows information across a distributed computer network to be stored and transmitted in a way that requires no central authority, thus minimizing, if not eliminating, opportunities to alter the data stored on it. With its distinct characteristics of transparency, immutability, and automation, the technology can be useful for bolstering supply chain's accountability.

Tracing

Blockchain allows for real-time visibility of goods and material movements in the supply chain. All operations emerge as a block of data within the blockchain, which means that a particular item can never be the same after transactions go through. For instance;

- According to Levin (2020), the diamond business utilizes the blockchain within the Kimberley process certification scheme, and so the coalitions offer financial assistance free from sources known to use human rights violations, restore trust with clients, donations are put to more ethical channels.
- Blockchains have been used in agriculture in tracing coffee and cocoa and tracing the goods back to the origin to ensure the fair trade practices.
- Blockchain enables stakeholders, businesses as well as regulators and consumers, to have trust that the product is procured and produced in an ethical way by providing the information base. Regulatory alignment, as Al-Naseri (2021) suggests, is a basic building block for building trust and efficiency in blockchain systems.

Blockchain and Security

A paramount feature of the blockchain is its unalterable nature due to the decentralization of the structure. What's interesting about the blockchain is that every bit of data is permanently secured when it is entered into the underlying structure. This guarantees the security of supply chain documentation. Data stored on the chain supports the prevention of fraudulent activities like false certifications or forged audit reports. For instance, a blockchain could help ascertain that suppliers respect the minimum wage requirements, or observe safety regulations. And in cases of breaches, the records on the blockchain can be presented in a court of law, thus tightening the enforcement measures (Tapscott & Tapscott, 2016).

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

Blockchain-based Applications

One class of blockchain-based applications that shows the potential to vastly improve the security and efficiency of operations are smart contracts. Smart contracts are automated contracts that self apply when conditions that are prefixed are met. In Supply Chains, policies that respect human rights can be enforced using smart contracts by tying the payment to the performance of specific actions that are verified by the systems. For example:

- A provider could be compelled to present evidence of having payed fair wages or ensured safe conditions of work, prior to issuing payments.
- Non-compliance can also be automated whereby if any condition is not met, payments may be avoided or audits triggered.

Administrative burden is massively lowered by smart contracts and further an accountability mechanism that is self-executing has been established (Christidis & Devetsikiotis, 2016).

Challenges of Blockchain Technology in Supply Chains

Although blockchain technology is useful in several aspects, it can be a problem when it comes to adoption. These challenges need to be tackled for its benefits to be fully harnessed.

Technical and Financial Barriers

There is a high cost associated with adopting blockchain including that of technology, infrastructures, and skilled labor. Many suppliers, especially developing nation counterparts, will be unlikely to meet the threshold required to be part of blockchain-enabled supply chains. This prompts worries of marginalizations since these sub-groups are bound to be shut out of the global market (Casino et al, 2019).

Data Accuracy and Verification

Blockchain guarantees that the data added to the database will be tampered with, however, it does not serve a purpose in ensuring the validity of the information. If wrong data is fed at the outset, the wrong data will persist in the blockchain. This brings into the limelight the importance of having effective systems to check the data entered into the database and the

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

need to have such activities conducted by external bodies like IoT devices or third party entities that can capture the activity in real time.

Privacy and Competitive Concerns

Sensitive information like suppliers and their prices may be made available to the public and this is one threat that blockchain transferability posits to companies' businesses. Businesses should seek to find a fine line between confidentiality and transparency to maintain their competitive edge and still be accountable (Zheng et al, 2017).

Regulatory and Juridical Sphere

The international character of supply chains means that any blockchain solutions have to reconcile different jurisdictions. For instance, the data privacy regulation such as the General Data Protection Regulation (GDPR) can be in opposition with blockchain's openness, making it hard to comply (Finck, 2018).

Case Studies: Blockchain Applications in Supply ChainsEthical Sourcing in the Fashion Industry

The exploitation of labor, especially in the underdeveloped world, has been an age-old bane for the fashion industry. Companies such as Provenance have, however, tried to shift this paradigm by employing blockchain to champion the cause of tracing textiles and garments through adherence with fair labor practices. Blockchain, through verification of every stage of production, allows consumers evidence of claims towards ethical practices, and ensures accountability of brands.

Conflict-Free Minerals in Electronics

Cobalt and tantalum, so indispensable to the electronics industry, are often drawn out of conflict-prone zones. RSBN (Responsible Sourcing Blockchain Network) records the geographical movement of these minerals23, ensuring an ethical traceability through ethical sourcing and processing channels. Companies regulated by the Acts such as Dodd-Frank

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

Nobucks which states 'managing the risks of conflict' are made easier through a global registry of history.

Fair Trade in Agriculture

Blockchain has participated actively in the agricultural value chains where fair trade initiatives are pursued. The BlocRice project instituted by Oxfam allows rice farmers in Cambodia complete the supply chain loops and get fair reward for the rice they grow Oxfam. enabled. In the same way, farmers are able to keep a ledger of all the transactions through the blockchain where selling price and payments are recorded وبالتالي curtailing exploitation by market middlemen.

Negative and Positive Effects of Blockchain Technologies

Increasing Reliability of Consumers'

Blockchain allows consumers to validate the ethical claims of brands, and in turn allows brands which value human rights to benefit. Such openness has the potential to promote the consumers' appetite for ethically sourced products, thus encouraging businesses to change for the better.

Fighting for the Rights of the Less-Powerful Employees

Blockchain enables the recording of employee earnings, their time worked, and their contracts showing evidence of their actions. These records are also resistant to alterations and thus reinforce compensation claims in scenarios of abuse helping cultivate fairness and safety in the labor market.

Reducing the Existence of Depleting Practices

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

Blockchain promotes traceability encouraging companies to seek sustainable approaches like waste reduction and lowered carbon footprints. It is also possible for consumers to patronize eco-friendly companies, creating a positive ripple effect.

The Way Forward: Policies and Collaboration

Great potential still exists with blockchain. However, further collaboration across governments, businesses and civil society is needed. Adoption encourages legal frameworks as do other challenges that include privacy and interoperability. Joining and forming initiatives, like the Blockchain Ethical Alliance, ensures best practices implementation across various industries.

Conclusion

The blockchain technology is a game-changer with respect to the problem of human rights abuses that have prevailed over the years. Its provisions for transparency, traceability and accountability are extremely useful in combating labor and child abuse as well as environmental degradation. Nonetheless, successful deployment would require translation of these technical, financial and regulatory constraints that exist. If implemented properly, there can be a shift within supply chains all over the world so that respect for human rights is upheld and wrongdoing does not go unaccounted for.

References

1. Amnesty International. (2016). This Is What We Die For: Human Rights Abuses in the Democratic Republic of the Congo Power the Global Trade in Cobalt.
2. Casino, F., Dasaklis, T. K., & Patsakis, C. (2019). A systematic literature review of blockchain-based applications: Current status, classification, and open issues. Telematics and Informatics, 36, 55-81.

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

3. N. Al-Naseri, "The Changing Landscape of Crypto Regulation in Europe," Blockchain Technology and Distributed Systems, vol. 1, no. 1, pp. 19–38, Jan. 2021
4. Christidis, K., & Devetsikiotis, M. (2016). Blockchains and smart contracts for the internet of things. IEEE Access, 4, 2292-2303.
5. Finck, M. (2018). Blockchain regulation and governance in Europe. Cambridge University Press.
6. International Labour Organization (ILO). (2021). Global estimates of modern slavery: Forced labour and forced marriage.
7. Levin, A. (2020). Blockchain's potential to transform the diamond supply chain. Journal of Business Ethics, 163(4), 619-630.
8. Tapscott, D., & Tapscott, A. (2016). Blockchain revolution: How the technology behind bitcoin is changing money, business, and the world. Portfolio Penguin.
9. Zheng, Z., Xie, S., Dai, H., Chen, X., & Wang, H. (2017). An overview of blockchain technology: Architecture, consensus, and future trends. IEEE International Congress on Big Data, 557-564.
10. Provenance. (n.d.). Blockchain solutions for transparent and ethical supply chains. Retrieved from https://www.provenance.org.
11. Responsible Sourcing Blockchain Network (RSBN). (n.d.). Enabling responsible sourcing of minerals. Retrieved from https://rsbn.org.
12. Oxfam International. (2018). BlocRice: Blockchain for fair rice trade. Retrieved from https://oxfam.org.
13. United Nations. (2011). Guiding principles on business and human rights. United Nations Office of the High Commissioner for Human Rights.
14. United Nations Global Compact. (2015). Supply chain sustainability: A practical guide for continuous improvement.
15. Kimberley Process. (n.d.). About the Kimberley Process. Retrieved from https://www.kimberleyprocess.com.
16. Amnesty International. (2018). Addressing human rights risks in global supply chains. Amnesty International Publications.
17. World Economic Forum. (2021). Building trust in the global supply chain with blockchain. Retrieved from https://www.weforum.org.

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

18. Blockchain Ethical Alliance. (2021). Promoting ethical practices in blockchain. Retrieved from https://blockchainethics.org.
19. Dodd-Frank Wall Street Reform and Consumer Protection Act. (2010). Section 1502 on conflict minerals.
20. European Commission. (2020). Promoting blockchain technology for sustainability and transparency in supply chains. Retrieved from https://ec.europa.eu.
21. World Bank. (2019). Blockchain and distributed ledger technology in supply chains. World Bank Group Discussion Paper.
22. Transparency International. (2021). Leveraging blockchain to combat corruption in supply chains. Retrieved from https://transparency.org.
23. Ethical Trade Initiative. (2019). Ethical trade and technology: Opportunities for blockchain. Retrieved from https://ethicaltrade.org.
24. IBM Food Trust. (n.d.). Transforming the global food supply chain with blockchain. Retrieved from https://www.ibm.com/foodtrust.
25. Deloitte. (2020). Blockchain for supply chains: Enhancing traceability and transparency. Deloitte Insights.
26. Accenture. (2019). Blockchain for good: The role of distributed ledger technology in ethical supply chains. Accenture Reports.
27. Global Blockchain Business Council (GBBC). (2021). Blockchain in supply chain management: Opportunities and challenges.
28. Kshetri, N. (2018). 1 Blockchain's roles in meeting key supply chain management objectives. International Journal of Information Management, 39, 80-89.
29. PwC. (2021). Blockchain's impact on supply chain transparency. Retrieved from https://pwc.com.
30. BitFury Group. (2018). Blockchain for social good: Enhancing human rights protections through technology.
31. European Union Agency for Fundamental Rights (FRA). (2020). Addressing human rights violations in global supply chains.
32. Fair Labor Association. (2017). Leveraging technology to improve supply chain accountability.
33. Blockchain Research Institute. (2020). Supply chain transformation through blockchain: Key case studies.

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0

34. United Nations Development Programme (UNDP). (2019). Blockchain for sustainable development goals.
35. Ethical Corporation. (2020). How blockchain can improve sustainability reporting in supply chains.
36. Fieseler, C., & Fleck, M. (2013). The pursuit of corporate responsibility through blockchain.
37. Blockchain Association. (2021). The future of ethical supply chains: Blockchain's role.
38. Economist Intelligence Unit. (2020). Blockchain and business ethics: Transforming supply chains.
39. Harvard Business Review. (2021). Decoding blockchain's role in ethical supply chains.
40. OECD. (2019). Blockchain for supply chain due diligence. OECD Policy Papers.
41. Boston Consulting Group (BCG). (2021). Blockchain in global supply chains: A roadmap for ethical transformation.

© DLABI - All Rights Reserved
Licensed under CC BY-NC-ND 4.0