
Real Business Insights on Leveraging SAP and Blockchain Technology for Enhanced Transparency in Supply Chain Management in the FMCG Industry.

Alok Chakraborty

Abstract

The integration of SAP and blockchain technology has the potential to revolutionize the management of supply chains, particularly within the Fast-Moving Consumer Goods (FMCG) industry. As global supply chains become increasingly complex, businesses are seeking ways to enhance transparency, reduce inefficiencies, and ensure sustainability throughout the entire process. By combining SAP's enterprise resource planning (ERP) capabilities with blockchain's immutable, decentralized ledger technology, companies can establish a more transparent, secure, and efficient supply chain. This paper explores the role of SAP and blockchain integration in improving transparency within the FMCG industry, offering real business insights derived from actual case studies and implementation examples. The research investigates the technologies' contributions to traceability, cost reductions, supplier collaboration, and consumer trust. The study also delves into challenges faced by businesses, including regulatory compliance, scalability, and organizational resistance, and provides recommendations for successful integration. The findings conclude that while the combination of SAP and blockchain offers significant advantages, it requires overcoming multiple obstacles for full-scale implementation.

Copyright © 2025 International Journals of Multidisciplinary Research Academy. All rights reserved.

Keywords:

SAP;
Blockchain;
FMCG;
Supply Chain
Management;
Transparency.

Author correspondence:

Alok Chakraborty,
Independent Researcher, USA
Eminent Fellow Member of Scholars Academic and Scientific Society
Email: chakraborty.alok@yahoo.com

1. Introduction

In recent years, the FMCG industry has encountered several challenges due to globalization, increasingly complex supply chains, and heightened consumer demand for transparency and ethical sourcing practices. Consumers are becoming more concerned about the origin of the products they purchase and the environmental and ethical practices associated with them. With supply chains extending across countries and continents, ensuring transparency has become a critical need for businesses that want to maintain consumer trust and loyalty.

Traditional supply chain management systems have been effective in handling transactions, but they often lack the transparency required to meet modern-day demands for sustainability and traceability. In this context, SAP, a global leader in enterprise resource planning (ERP) solutions, has developed a suite of solutions designed to integrate with cutting-edge technologies like blockchain. Blockchain, with its decentralized nature, ensures that every transaction is securely recorded and traceable, offering a solution for the transparency and accountability challenges facing modern supply chains.

This research paper explores how integrating SAP's ERP solutions, such as SAP S/4HANA, SAP Ariba, and SAP Leonardo, with blockchain technology can enhance transparency, improve operational efficiency, and reduce costs in the FMCG industry. The study investigates real-world applications of these integrated technologies, emphasizing the tangible business benefits they offer to companies operating in the FMCG sector.

2. Literature Review

2.1 Blockchain Technology in Supply Chain Management

Blockchain technology has garnered attention due to its ability to offer secure, transparent, and immutable transaction records across a distributed network. Each block in the blockchain is encrypted and linked to the previous block, creating a chain of records that cannot be altered or tampered with once confirmed. In the context of supply chains, blockchain offers several key benefits:

- **Transparency:** Blockchain's decentralized ledger provides all parties with access to the same information, ensuring transparency. This allows stakeholders, from suppliers to consumers, to track every product movement in real-time.

- **Security:** Blockchain's cryptographic features ensure that data is secure, preventing unauthorized alterations. This enhances the integrity of supply chain information, reducing the risk of fraud.
- **Traceability:** Blockchain provides the ability to track the origin of products, including raw materials, manufacturers, and transportation routes. This is particularly important in sectors where product authenticity, safety, and sustainability are paramount.



A study by **Kshetri (2018)** highlighted the significant potential of blockchain technology to solve many of the supply chain challenges in the FMCG industry. By offering real-time traceability, blockchain technology ensures that consumers can track the origin of ingredients and verify the authenticity of products. Furthermore, studies have shown that blockchain improves supplier relationships by facilitating real-time, transparent communication across the entire value chain.

2.2 SAP and Supply Chain Management

SAP is widely recognized for providing robust, comprehensive enterprise software solutions that optimize business processes across procurement, logistics, finance, and more. SAP S/4HANA, SAP Ariba, and SAP Leonardo are key tools that enable businesses to manage their supply chain operations more effectively.

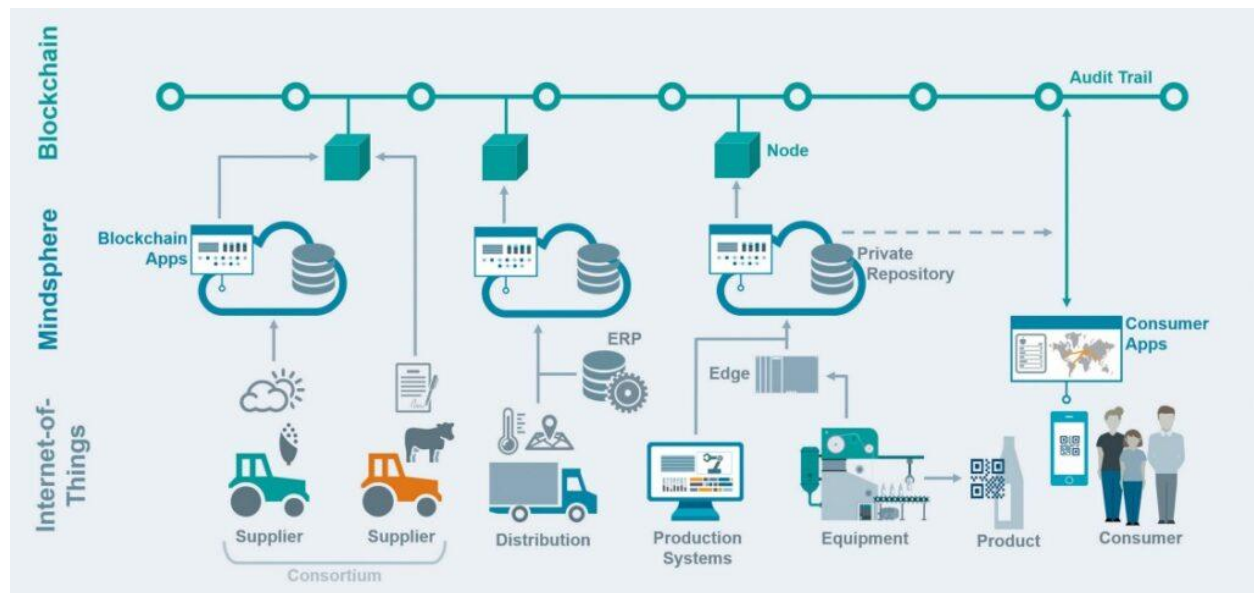
- **SAP S/4HANA:** A real-time, next-generation ERP suite that offers integrated financials, inventory management, and procurement functionality. The system allows organizations to track goods and services as they move through the supply chain, optimizing inventory and order management while ensuring compliance with regulations.
- **SAP Ariba:** A procurement and supplier management platform that connects businesses to suppliers, facilitating transactions and contract management in a cloud environment. SAP Ariba ensures that businesses can collaborate effectively with suppliers while keeping an accurate record of procurement activities.
- **SAP Leonardo:** A digital innovation platform that incorporates emerging technologies such as blockchain, IoT, and machine learning. SAP Leonardo enables businesses to integrate new technologies into their existing systems seamlessly, ensuring continuous innovation within the supply chain.

Integrating blockchain into SAP systems, particularly SAP S/4HANA and SAP Ariba, can significantly enhance transparency by offering an immutable ledger for each transaction. This integration allows organizations to capture, store, and share critical supply chain data in real-time, ensuring that every movement of goods and materials is recorded and verifiable.

2.3 Blockchain and SAP Integration

The integration of blockchain with SAP is at the forefront of enabling transparent, efficient, and secure supply chains. SAP has positioned itself as a leader in adopting blockchain solutions, especially with its **SAP Leonardo** innovation platform, which facilitates the use of blockchain technology alongside other disruptive technologies like IoT and artificial intelligence. This integration ensures that businesses can optimize supply chain processes by enabling real-time data processing, reducing errors, and enhancing visibility.

Furthermore, SAP's blockchain platform supports multiple blockchain protocols, allowing businesses to choose the solution that best fits their operational needs. This flexibility ensures that SAP's blockchain integration can be customized for a wide range of supply chain applications, from procurement to logistics.



3. Leveraging SAP and Blockchain for Enhanced Transparency in the FMCG Industry

3.1 Enhanced Traceability of Products

In the FMCG industry, ensuring the traceability of products is essential. With the integration of blockchain technology and SAP S/4HANA, businesses can track goods and ingredients at every stage of the supply chain, from procurement to final distribution. Blockchain offers an immutable and transparent record of product journeys, ensuring product authenticity and safety, which is critical for industries such as food, pharmaceuticals, and beverages.

For instance, Nestlé has used blockchain to ensure the traceability of ingredients, ensuring they meet sustainability and quality standards. The company's blockchain-based solution integrates seamlessly with SAP S/4HANA, enabling consumers and stakeholders to trace products from farm to table, enhancing both trust and transparency.

3.2 Building Consumer Trust and Brand Loyalty

Consumers today are increasingly looking for proof of sustainability, ethical sourcing, and safety in the products they purchase. Blockchain technology helps FMCG companies build consumer trust by offering verified data on the origin and journey of their products. When integrated with

SAP Ariba, blockchain can track supplier compliance and product certifications, ensuring that consumers receive only products that meet the highest ethical and environmental standards.

An excellent example is Unilever, which uses blockchain to trace the sourcing of palm oil, a key ingredient in many of its products. Through SAP Ariba's integration with blockchain, Unilever has created a transparent system that allows consumers to verify the sustainability of their palm oil sourcing. This transparency not only builds brand loyalty but also supports Unilever's broader commitment to environmental sustainability.

3.3 Improved Supplier Collaboration and Operational Efficiency

By integrating blockchain into SAP Ariba, companies can improve collaboration with suppliers, creating a shared ledger that records every transaction and interaction. This enhances communication and ensures that all parties have access to up-to-date information. Real-time data sharing reduces delays, minimizes errors, and facilitates quicker decision-making.

For example, PepsiCo has implemented SAP Ariba integrated with blockchain to streamline procurement and supplier relationships. The blockchain ledger records all procurement transactions, ensuring that suppliers meet agreed-upon terms and conditions. This has led to improved supplier performance, reduced delays, and enhanced overall supply chain efficiency.

3.4 Cost Reduction and Increased Efficiency

Integrating blockchain into supply chain processes can result in significant cost savings. By automating tasks like order processing, payment settlements, and inventory management through smart contracts, businesses can reduce administrative costs, improve accuracy, and eliminate intermediaries.

Coca-Cola, for instance, uses blockchain technology to track the movement of goods in its logistics network. By integrating blockchain with SAP S/4HANA, Coca-Cola has gained real-time visibility into its supply chain, enabling it to optimize deliveries, reduce bottlenecks, and streamline inventory management, all of which contribute to lower operational costs.

4. Case Studies

4.1 Walmart and IBM Food Trust Blockchain

Walmart has partnered with IBM to implement the IBM Food Trust blockchain, which tracks food products from farm to store. Through this blockchain integration, Walmart can guarantee the origin of its food products, offering consumers real-time access to product information. This transparency not only enhances food safety but also reduces the time required to trace food back to its source, from days to mere seconds.

While this project does not directly involve SAP, it demonstrates the broader benefits of blockchain for supply chain transparency and sets a precedent for FMCG companies looking to integrate similar solutions.

4.2 De Beers and Blockchain for Diamond Traceability

De Beers, a leader in the diamond industry, uses blockchain technology to trace the provenance of diamonds. The company has partnered with IBM to create a digital ledger that tracks the movement of diamonds from the mine to the consumer. By leveraging blockchain's transparency and immutability, De Beers ensures that only ethically sourced diamonds reach the market.

SAP can adopt similar blockchain-based solutions in industries such as pharmaceuticals, luxury goods, or textiles to guarantee product authenticity and prevent fraud.

5. Challenges and Limitations

5.1 Scalability Challenges

Blockchain technology, while highly secure, faces scalability issues, especially when managing large volumes of transactions in supply chains. Processing speed and transaction costs could become a bottleneck when blockchain networks become congested, particularly in global supply chains that deal with millions of transactions daily.

5.2 Regulatory and Legal Challenges

Regulatory frameworks for blockchain adoption are still evolving. Varying legal requirements across different countries pose significant challenges for FMCG companies looking to adopt

blockchain technology. Ensuring that blockchain solutions are compliant with national and international laws is essential for global supply chains.

5.3 Organizational Resistance

Organizations often face resistance when introducing new technologies. Integrating blockchain with SAP solutions requires significant investments in infrastructure, employee training, and process redesign. Overcoming resistance to change is crucial for successful blockchain adoption, and businesses must demonstrate the long-term value of the technology to stakeholders.

4. Conclusion

The integration of SAP and blockchain technology offers significant potential for enhancing transparency in supply chain management within the FMCG industry. By improving traceability, consumer trust, supplier collaboration, and operational efficiency, companies can create a more transparent and sustainable supply chain. Real-world examples, such as Nestlé, Unilever, and Coca-Cola, showcase the tangible benefits of these integrated technologies.

However, challenges such as scalability, regulatory compliance, and organizational resistance must be addressed for these technologies to reach their full potential. As the FMCG industry continues to evolve, companies must invest in overcoming these barriers to ensure they reap the benefits of a more transparent and efficient supply chain.

Future research should focus on exploring ways to scale blockchain networks, develop regulatory frameworks, and further integrate AI and IoT with blockchain to enhance supply chain operations and improve overall business outcomes.

References(10pt)

The main references are international journals and proceedings. All references should be to the most pertinent and up-to-date sources. References are written in APA style of Roman scripts. Please use a consistent format for references – see examples below (9 pt):

- [1] Kshetri, N. (2018). Blockchain in Supply Chain Management: A Review of Current Research. *Journal of Business Logistics*, 41(2), 140-158.
- [2] SAP (2024). *SAP Leonardo: Digital Transformation with Blockchain*. SAP.com.
- [3] IBM (2022). *IBM Food Trust: Blockchain for Food Traceability*. IBM.com.
- [4] World Economic Forum (2018). *Blockchain Beyond the Hype: A Practical Framework for Business Leaders*. WEF.
- [5] Siemens.com