

Uncovering Blockchain's Potential for Supply Chain Transparency: Qualitative Study on the Fashion Industry

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Abstract: With the capacity to increase security and transparency, blockchain technology is being used as an interesting subject of investigation in the fashion industry. This underscores the importance of this current research endeavour. In terms of supply chain transparency, the fashion industry faces considerable barriers, thus requiring new approaches such as blockchain that can address issues such as child labour, unethical payment practices, and environmental impact. Main objective of this research is to identify how blockchain technology can improve transparency, accountability, and compliance with ethical standards. However, knowledge of the specific ways in which blockchain technology can improve transparency in the fashion supply chain, including the drivers and barriers, needs to be improved. The research method is described through a qualitative approach that includes in-depth interviews, participatory observation, and document analysis to collect data from various stakeholders in the industry, including manufacturers, distributors, and consumers. Explanation provides an overview of how the researcher collected and analysed data to achieve the research objectives. Blockchain increases transparency through the provision of verifiable and durable product records and fosters consumer-brand trust. Blockchain facilitates accountability and compliance with environmental and ethical standards, according to key findings. Research detected significant barriers, including exorbitant costs for implementation, limited knowledge of technology, and difficulties in fostering collaboration among relevant parties. Results of this study have far-reaching consequences, providing valuable insights to fashion industry stakeholders on how to overcome barriers to blockchain adoption. Long-term benefits of enhanced supply chain transparency and strategic recommendations ensure a smooth implementation process.

Keywords: Blockchain; Fashion Industry; Stakeholder Insights; Supply Chain; Transparency

INTRODUCTION

In this era of rapid technological advancement, blockchain technology has been hailed as a game-changer that could revolutionize numerous sectors, including the fashion industry. Blockchain's key characteristics (Hindarto, 2023a), such as decentralization, security, and transparency, offer unique solutions to challenges that have long plagued fashion industry supply chains. Increased transparency can help address critical issues such as unethical labor practices, negative environmental impacts, and product counterfeiting. By uncovering the potential of blockchain for supply chain transparency (Behl et al., 2023), this research aims to provide new insights and pave the way for more ethical and sustainable implementations in the fashion industry. The relevance of this research is reinforced by the increasing consumer demand for sustainability and ethics in fashion production. Consumers today demand not only high quality in the products they buy but also transparency in the manufacturing process. This means that clothing companies are under increasing pressure to make sure that their supply chains are free of practices that are bad for society and the environment. In this context, blockchain offers the ability to trace the origins of materials and finished products, giving consumers peace of mind about the authenticity and ethics behind their purchases. Because it can show how the fashion industry can use blockchain technology to be more transparent, sustainable, and trustworthy, this study is significant from both an academic and practical standpoint.

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In this literature review, various studies have investigated the application and potential of blockchain in improving supply chain transparency. Blockchain offers the possibility to revolutionize the way information is shared between stakeholders by providing a secure and immutable platform for transaction records. This research underscores the importance of system design that considers the specific needs of the fashion industry to maximize blockchain's potential. Applying integrated Blockchain and Big Data technologies (Da et al., 2021), (Hindarto & Djajadi, 2023) to improve supply chain traceability and information sharing in the textile sector (Hader et al., 2022). Researchers investigated the integration of blockchain with other technologies to create a more transparent and efficient supply chain. The results of this study emphasize that blockchain is key to overcoming the challenges of complex supply chain transparency. Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers, provides a broader perspective on the utilization of blockchain for sustainable supply chain management (Kouhizadeh et al., 2021). By analyzing blockchain application cases in various industries, it concludes that blockchain can play a crucial role in promoting ethical and sustainable supply chain practices. Blockchain implementation can significantly improve compliance with environmental and social standards and strengthen the relationship between producers and consumers.

The research conducted by the researcher fills a knowledge gap that exists in the literature by focusing on the specific implementation of blockchain in the context of enterprise architecture (Hindarto, 2023) for the fashion industry, which has yet to be extensively explored in previous studies. While previous studies have recognized the potential of blockchain to improve supply chain transparency and sustainability, there is still a need to investigate further how this technology can be effectively integrated into existing enterprise architecture frameworks (Hindarto, 2023). This research uses a qualitative methodology to analyze and design the implementation of blockchain in EAs by collecting data through in-depth interviews, participant observation, and document review. This approach allows the researcher to gain an in-depth understanding of the challenges, needs, and opportunities specific to the fashion industry in implementing blockchain. It provides valuable insights on how to overcome these obstacles.

In this proposed research, the researcher hopes to create a blockchain implementation framework that fashion companies can adopt to increase transparency in their supply chains. The research findings will likely provide practical and strategic guidance for fashion companies to integrate blockchain into their EA systems, ensuring that supply chain data can be easily tracked and verified by all stakeholders. In addition, the study aims to identify the key factors that influence the success of blockchain implementation in the fashion industry, including technical, organizational, and social aspects. The results are expected to make a significant contribution to the literature on supply chain management and blockchain technology, particularly in the context of enterprise architecture (Hindarto, 2024).

The contribution of the proposed research compared to previous studies lies in its specific application in the context of enterprise architecture. While previous studies have focused more on the general potential of blockchain or its application in broader scenarios, this research delves into how blockchain can be integrated into the existing EA structure in the fashion industry. This research not only adds to the literature on blockchain and supply chain management but also provides new insights into the application of this technology within a complex enterprise architecture framework. By focusing on practical and industry-specific applications, this research provides more targeted and relevant guidance for fashion companies looking to implement blockchain to improve supply chain transparency, making this contribution unique and valuable in the related field of study.

This research seeks to understand how blockchain technology can be integrated into enterprise architecture frameworks. Increase fashion supply chain transparency. Design an effective and efficient implementation framework that supports indelible supply chain data recording and verification and industry stakeholder collaboration and trust through this research. Identify fashion industry blockchain adoption drivers and challenges and propose practical solutions by providing valuable blockchain integration insights in enterprise architecture (Hindarto & Putra, 2024). Thus, the main goal of this research is to empirically demonstrate how blockchain, when integrated with enterprise architecture, can improve the fashion industry supply chain's transparency and sustainability while contributing to industry literature and practice.

This research is essential as the fashion industry faces complex issues of transparency, unethical practices, and regulatory compliance. Blockchain offers an effective solution. This study addresses two critical questions: How can IoT technology be integrated with blockchain in an Enterprise Architecture framework to enhance data tracking and verification in the fashion industry supply chain? (RQ1). What strategies can fashion industry stakeholders use to overcome blockchain implementation challenges and improve supply chain transparency? (RQ2).

LITERATURE REVIEW

In the rapid development of information technology, the concept of Blockchain Technology (BCT), first proposed by Nakamoto in 2009, has attracted the attention of academics and practitioners. Through his research, Nakamoto defined BCT as a technology that utilizes data mining techniques and Bitcoin to develop data structures and encrypt information transactions. As described research (Nakamoto, 2009), information in the blockchain will

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be permanently stored online, with a high level of transparency and security. Research conducted by (Li et al., 2018) asserts that the critical characteristics of BCT include decentralization, mistrust, transparency, traceable and unfalsifiable transactions, anonymity, and credibility. Furthermore, (Yang, 2019) explains in his work that blockchain technology has applications beyond cryptocurrencies and capital markets. (Lu, 2018) argues that the technology has also been intensely practiced in intelligent contracts, network security and privacy, and other applications and platforms. The development of BCT can help organizations develop collaborative services using the Internet of Things (IoT), as described by (Li Da Xu, 2019). In this context, service architecture is also undergoing updates due to the rapid development of BCT, as defined by (Viriyasitavat et al., 2019). In addition, BCTs offer practical support for the transition to a circular economy (CE). According to research conducted by Alexandris et al. (2018), BCT helps integrate and share supply chain information. Thus, materials and product exchange can proceed smoothly. (Kouhizadeh et al., 2019) added that BCT offers higher security in terms of online information storage and management. These characteristics can prevent the leakage of confidential information and help protect the organization's intellectual property.

This research aims to develop a blockchain system architecture for circular supply chain management in the fast fashion industry, focusing on environmental sustainability and social responsibility (Wang et al., 2020). The results show that blockchain improves transparency and data security, supporting collaboration between actors. However, there are gaps in its practical application that require further study to integrate this technology into daily operations. Research explores the influence of artificial intelligence (AI) and blockchain technology on supply chain financial resilience under dynamic environmental conditions (Gupta et al., 2023). Results show that blockchain is more effective than AI in strengthening financial resilience through increased transparency and security. This study identifies gaps in the literature regarding fund mobilization and transaction transparency, suggesting the need for integrating these two technologies for financial resilience optimization (Pattanayak et al., 2024). The study examines the influence of blockchain technology on supply chain performance, emphasizing the building of trust and relational capabilities. Findings suggest trust, relational capabilities, and dynamics act as mediators in the relationship between blockchain and supply chain performance—research gaps, especially on supply chain uncertainty and its relationship with trust, warrant further empirical investigation.

Finally, (Rusinek, M. J., Zhang, H., & Radziwill, 2018) highlighted that all supply chain members, especially consumers, can access information faster from upstream, such as aspects related to design, raw materials, and manufacturing processes. BCT can facilitate consumers' understanding of the entire supply chain and thus improve integration and collaboration among supply chain members. In conclusion, blockchain technology offers great potential to support various aspects of security, transparency, and cooperation in the management of information and transactions in today's digital era.

METHOD

This research is designed as a qualitative study using an analytical descriptive method. The approach adopted in this research is normative empirical, which means that the focus of this research is not only to observe existing phenomena but also to understand the norms and theories relevant to the implementation of blockchain technology in the fashion industry to improve supply chain transparency. This method enables researchers to thoroughly examine how integrating blockchain can address the requirement for transparency in the supply chain, along with the obstacles and possibilities in implementing it in the fashion sector.

Data sources for this research include journal reviews, documentation, and literature. This method allows researchers to analyze how comprehensively incorporating blockchain technology can meet the need for transparency in the supply chain, as well as the challenges and opportunities in implementing it in the fashion industry. Document and literature analysis was conducted to gain a comprehensive understanding of the status quo, challenges, and best practices in blockchain implementation for supply chain transparency. The sources were chosen for their relevance and novelty to ensure that the research reflects the most recent advancements in the field of study. Indonesia was chosen as the location for this research, as the country has a rapidly growing fashion industry with unique supply chain transparency challenges. The selection of Indonesia as the research location was based on the massive potential for blockchain applications in the burgeoning local fashion industry and the need to improve transparency and sustainability standards. With its resource diversity and supply chain complexity, Indonesia provides a rich context for examining blockchain adoption and its impact on supply chain transparency. Data analysis was performed through an inductive approach, analyzing data from the literature review and documentation to pinpoint critical themes, patterns, and insights. As part of this procedure, we sorted the data into categories, looked for trends, and learned more about the data's context and meaning. The explanation can be seen in figure 1.

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Figure 1. Research methodology.
Source: Researcher property

Literature study, survey, interview

During the Literature Study, Survey, and Interviews phase of the research titled "Uncovering Blockchain's Potential for Supply Chain Transparency: A Qualitative Study on the Fashion Industry," the initial task involved examining existing literature to gain a comprehensive understanding of blockchain technology and its role in enhancing supply chain transparency, specifically within the fashion industry. The researcher obtained data from scholarly publications, industry reports, and pertinent case studies to acquire a comprehensive comprehension of the obstacles encountered in the fashion supply chain and how blockchain technology can offer remedies for these issues. The study examined past applications of blockchain technology in different industries to assess their achievements and challenges in implementation, as well as their implications for stakeholders in the fashion industry.

Subsequently, researchers formulated and disseminated a survey to professionals within the fashion industry, encompassing individuals involved in manufacturing as well as retail, with the aim of collecting empirical data regarding their perspectives on blockchain technology. The survey was created to measure the level of knowledge, opinions, and potential acceptance of technology within the industry. In addition to the study, comprehensive interviews were carried out with several blockchain specialists, supply chain managers, and key figures in the fashion industry. The purpose of these interviews was to obtain a more profound understanding of the industry's particular requirements, challenges encountered, and the capacity of blockchain technology to tackle transparency concerns. This research employs data triangulation methods to investigate the potential of blockchain technology in transforming the fashion industry's management and sharing of supply chain information. The goal is to enhance consumer trust and promote sustainability.

Meetings with all stakeholders

The researcher organized a series of well-organized meetings with essential individuals involved in the fashion industry. The participants encompassed raw material producers, designers, manufacturers, distributors, retailers, and representatives from consumers. The purpose of these meetings was to ascertain and comprehend the various viewpoints of each stakeholder regarding the utilization of blockchain technology in their supply chain. The discussions explored subjects including sustainability, ethical production, and the necessity for increased transparency and product tracking. The researchers utilized this data to ascertain the distinct requirements and obstacles encountered by every stakeholder within the framework of supply chain transparency.

Additionally, the meeting aimed to investigate possible synergies between the stakeholders and blockchain technology. Researchers examined the potential use of this technology to aid in verifying the origins of raw materials, production processes, distribution, and final purchase by consumers. Stakeholders were also taught about the basic ideas behind blockchain technology and how it could help make decisions based on data and make businesses more accountable. This meeting gave researchers a lot of different types of qualitative data that will help them fully understand how blockchain can be used in the fashion industry to achieve the level of transparency they want.

Fashion Industry Business Visioning

Business Vision for the Fashion Industry phase was all about coming up with a business plan that people in the fashion industry could use. In this vision, honesty and long-lasting use must be seen as fundamental principles that must be applied in all parts of the business, from getting the materials to selling them to customers. This goal was set by researchers who came up with ways that using blockchain technology could help reach it by giving more transparency along the value chain. Not only does being transparent about where clothes come from and how they are made meet consumer demands for sustainability, but it also helps fashion companies build their brand reputation and meet stricter rules on supply chain reporting.

When researchers were coming up with the business vision, they also thought about problems that might come up. For example, integrating new technologies can be challenging, people in the industry may want to stay the

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same, and stakeholders may need training and education on blockchain. The study also predicted that using blockchain would improve operational efficiency, boost consumer confidence, and have a minor negative effect on the environment. This vision not only shows how the fashion industry can have a more open and long-lasting future, but it also urges everyone involved to begin the digital transformation process by making blockchain a central part of their business plan.

Meetings with all stakeholders

Essential contacts in the fashion industry are sought out during this phase of the research process. Researchers arranged online meeting places for people from all walks of the fashion industry, including manufacturers, retailers, raw material suppliers, designers, and consumer groups. In order to achieve supply chain transparency, these meetings sought better to understand the requirements and expectations of each party. In these organized gatherings, participants shared their thoughts on the state of sustainability in the industry, the difficulties of product tracking, and their openness to using blockchain technology.

In addition, researchers aimed to address potential issues with blockchain implementation, including implementation costs, technical complexity, and data security, during these meetings. Stakeholders were able to work together in support of transparency initiatives thanks to this interactive conversation, which painted a clear picture of how blockchain can be integrated into current systems. In order to develop a workable implementation plan that would maximize benefits for all stakeholders, all collected inputs were critical.

Building Data Architecture

Creating an all-encompassing framework for data organization and management across the fashion industry's supply chain was the focus of this stage. After analyzing the existing data structure, researchers settled on the optimal approach to blockchain technology integration. The first step in this strategy was to determine what information was necessary to record on the blockchain, such as the place of origin of raw materials, the details of manufacturing, and the distribution of finished goods. Researchers want to build a data architecture that can adapt to future changes and business scale by developing a standardized schema that is also flexible. This will help with current needs as well.

Researchers also built data architecture with data security and privacy principles to make even more sure that sensitive data is safe and that rules like GDPR are followed. With the architecture's focus on building trust and transparency, stakeholders can access information in real-time without compromising the authenticity or integrity of the data. The data architecture was tested and validated by researchers in close collaboration with IT specialists and industry stakeholders. This laid the groundwork for safe and effective blockchain applications to increase supply chain transparency in the fashion industry.

Technology Architecture Development

The researchers concentrated on developing a solid system design that would serve as the foundation of blockchain technology. Choosing the right blockchain platform involves considering scalability, security, and flexibility to meet the requirements of various stakeholders in the fashion sector. Experts analyzed different blockchain platforms, considering the advantages and disadvantages of each. For example, Ethereum offers smart contracts, while Hyperledger provides enhanced privacy and control. Researchers analyzed technical parameters such as consensus mechanisms, cryptographic algorithms, and interoperability with existing IT systems based on transaction volume and data sensitivity.

Furthermore, researchers verify that the technology architecture created aligns with the business's operational requirements and strategic goals. They plan infrastructure to guarantee system availability and resilience, such as servers, networks, and data storage solutions. All these parts were created to function together smoothly, allowing for effective data transfer and flawless product verification. By working closely with IT experts, researchers developed a technology architecture blueprint that addresses current transparency challenges and promotes ongoing innovation in the fashion industry.

RESULT

This study aims to analyze how blockchain technology can enhance transparency in the fashion industry supply chain. The analysis results offer valuable insights for addressing the research question of blockchain's ability to reveal and maintain transparency in the industry. Experts discovered that utilizing blockchain technology enables the tracking of a product's complete path from production to end-user.

Based on the study findings, researchers discovered that integrating blockchain technology enhances transparency in the supply chain by securely recording every transaction. These findings indicate that blockchain technology can help solve trust and product authenticity challenges commonly faced in the fashion industry. Utilizing blockchain technology has been shown to be highly effective in offering undeniable evidence of a product's source and legitimacy, which is crucial in the fight against counterfeit goods and in promoting ethical business conduct. As seen in figure 2, which is a proposal of the fashion industry and blockchain method.

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The research also uncovered that implementing blockchain technology could revolutionize sustainability policies and practices in the fashion sector. Blockchain technology not only improves companies' ability to verify and report on their sustainability practices but also empowers consumers to make better-informed decisions. This fosters a push for companies to enhance their processes and promote transparency as a critical aspect of brand value. The potential for blockchain technology to increase trust and transparency in the fashion industry has been proven.

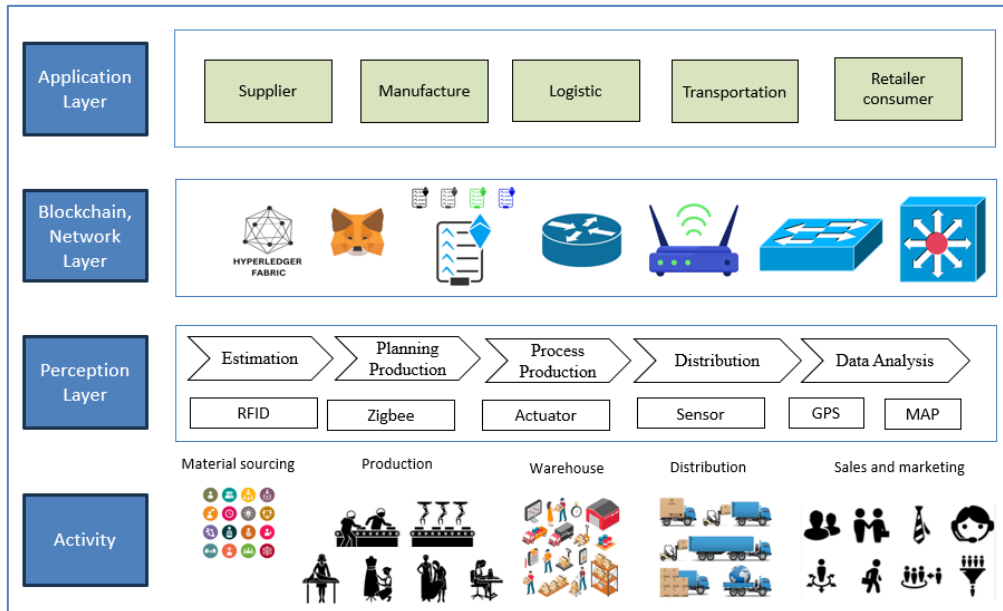


Figure 2. Proposed Architecture Fashion Industry.
Source: Researcher property

As illustrated in Figure 3, the implementation of blockchain technology throughout the entire supply chain of the fashion industry can be transparently and precisely documented. All transactions, from the acquisition of raw materials to the final distribution of finished goods, are reported in an immutable sequence of blocks. Significant advancements were detected by researchers in the organization's capacity to trace the provenance of raw materials, manufacturing procedures, distributors, transportation, and end users. This information can be graphically depicted as a supply chain graph, where each block symbolizes a transaction that occurs along the supply chain and illustrates the flow of products and associated data. Such visual components facilitate comprehension of the intricacy of the product flow while preserving the integrity of the data.

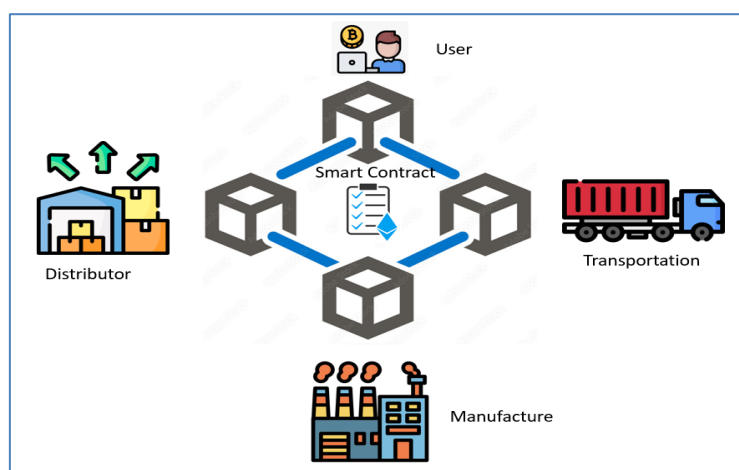


Figure 3. Blockchain and Smart Contract on Fashion Industry.
Source: Researcher property

The findings of this research indicate that blockchain technology possesses the capacity to revolutionize the fashion sector, particularly regarding the transparency of supply chains. By virtue of the blockchain's capacity to log each transaction and movement, a system is established that fosters integrity and accountability in the business

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realm. This is consistent with the conclusions drawn by (Li et al., 2018), who emphasized the capacity of blockchain technology to store data securely and transparently. This study provides further evidence in favor of (Yang, 2019) contention that the decentralization and transparency attributes of blockchain are critical for establishing the supply chain system's credibility. Unanticipated discoveries, such as the possibility of novel business models, broaden the comprehension of blockchain applications beyond their technical ramifications and into the realm of business innovation. These results are highly pertinent to (Lu, 2018) analysis of blockchain's potential uses outside of cryptocurrencies, indicating that this technology is applicable to a wide range of business domains. The congruence between these results and those found in the existing body of literature suggests that the study not only validates the outcomes of prior investigations but also offers novel perspectives on the influence of blockchain technology on innovation in the business sector.

The findings of this research make a substantial contribution to the existing literature by highlighting how blockchain technology can be integrated explicitly into fashion enterprise architecture to support transparency and accountability in the supply chain. Intellectually, this research reveals the possibility of new business models that leverage the openness and decentralization of blockchain not only as a tool for data security but also as a driver of business innovation in the fashion industry. Here are some of the intellectual contributions offered by this research:

1. **Framework for Blockchain Integration in Enterprise Architecture:** This research develops a detailed framework on how to integrate blockchain into the fashion industry's Enterprise Architecture (EA). This not only strengthens security and transparency but also redefines workflows and business processes to incorporate better sustainability policies and ethical practices, which were previously underemphasized in more general blockchain implementations.
2. **Blockchain-Based Business Models for the Fashion Industry:** One unexpected finding was the identification of business models that could be adapted or created anew thanks to blockchain's ability to create complete and immutable transparency in transaction records. These business models could include collaborative platforms between designers, suppliers, and retailers to increase consumer trust through stricter verification of product origins.
3. **Mapping the Barriers and Drivers of Blockchain Adoption:** This research not only chronicles blockchain applications but also deeply analyzes the factors that influence their successful implementation in the context of the fashion industry. It provides practical insights into how these barriers can be overcome, offering tangible value that previous studies may have yet to address fully.
4. **Contribution to Sustainability Practices:** This research also expands the understanding of how blockchain can support sustainability initiatives in the fashion industry. By accurately tracking raw materials and finished products, blockchain helps fashion companies not only meet but exceed the sustainability standards expected by consumers and regulators.
5. **Validation and Extension of Previous Studies:** By integrating findings from previous studies and augmenting them with new empirical data, this research not only validates the results of previous studies but also extends the application of blockchain from a technical aspect to a strategic and innovative aspect in business.

This research provides a new and in-depth perspective on blockchain applications in the fashion industry. It shows how this technology is changing not only the way information is stored and shared but also the way the industry operates and innovates. It adds a critical layer to the academic and practical discussions on blockchain and digital transformation in the fashion sector.

When juxtaposed with the results of other investigations, this study contributes to the body of knowledge by providing a more comprehensive outlook on the application of blockchain technology. For instance, the survey by (Alexandris et al., 2018) posits that blockchain facilitates the seamless interchange of materials and products. Similarly, this research adds that technology empowers enterprises to establish frameworks that emphasize consumer engagement and sustainability. In a similar vein, the research conducted by (Kouhizadeh et al., 2019) is consistent with the present study's emphasis on the supplementary advantage of transparency and information security via blockchain technology for safeguarding intellectual property. Considering the primary inquiries posed in the Introduction, this study provides empirical evidence to support the idea that blockchain technology can improve the level of transparency in the fashion industry's supply chain. The technology enables all stakeholders to track and validate products in real time by furnishing immutable information regarding each stage of the supply chain. This aids in addressing the inquiry regarding the potential of information technology to enhance supply chain transparency.

Furthermore, this research makes a substantial contribution to the existing body of literature. Through an examination of the practical implementations of blockchain technology within the fashion sector, this study not only validates prior research but also expands the domain of comprehension concerning the capabilities of this innovation. The study demonstrates how blockchain technology can facilitate greater consumer engagement, promote sustainability initiatives, and act as a catalyst for positive change. Therefore, this study provides a significant contribution to the discourse surrounding the implementation of blockchain technology in the fashion industry to achieve transparency and sustainability.

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DISCUSSIONS

How can IoT technology be integrated with blockchain in an Enterprise Architecture framework to enhance data tracking and verification in the fashion industry supply chain? (RQ1).

A robust approach to enhancing data tracking and verification in the fashion industry's supply chain is to integrate Internet of Things technology with blockchain within an enterprise architecture framework. With the Internet of Things, a network of sensors and devices that are all connected can track where goods are, how they're doing, and how they're moving in real-time. Integrating this data with blockchain makes the information unchangeable and verifiable by everyone involved, guaranteeing the product's authenticity and origin. Within the EA framework, the integration of IoT and blockchain allows for the development of a trustworthy distributed information system. Here, the data gathered by the IoT can be recorded and stored directly on the blockchain, creating a central database that all parties involved in the fashion industry—from manufacturers to retailers to shoppers—can access and use.

Businesses in the fashion industry can significantly benefit from integrating EA and AI if they lay the groundwork for the two technologies to complement each other. Making smart contracts to automate data validation and verification processes and building secure communication protocols between IoT devices and blockchain platforms are all part of this. Using pre-defined conditions, intelligent contracts can automate tasks like updating delivery status or checking for sustainability standards compliance. Consequently, EA's operational efficiency and responsiveness to sustainability concerns are both enhanced by the integration of IoT and blockchain, which also boosts trust and transparency in the supply chain. This method can help the fashion industry attain full supply chain transparency by allowing for an unprecedented degree of data tracking and verification.

What strategies can fashion industry stakeholders use to overcome blockchain implementation challenges and improve supply chain transparency? (RQ2).

Stakeholders in the fashion industry can improve supply chain transparency and overcome the challenges of blockchain implementation by implementing several key strategies. The first step in getting everyone involved in the supply chain—from producers to buyers—to understand and make use of blockchain technology is education and training. Blockchain technology has many uses, and this training should go over the fundamentals, including how it works in the fashion industry and the advantages it has for supply chain transparency. This instruction can be given in a variety of formats, including online classes, seminars, and workshops, and can be tailored to students' skill levels. Companies can help blockchain gain traction in the industry by raising awareness of the technology.

The second point is that the difficulties of blockchain implementation can be better overcome through stakeholder collaboration. To make sure blockchain works well with current supply chain systems in the fashion industry, brands, suppliers, logistics, and tech platforms all need to work together closely. To facilitate the sharing of development costs, risks, and benefits associated with blockchain implementation, this collaboration may involve the establishment of blockchain consortiums or joint initiatives. The development of industry standards that can enable the widespread adoption and interoperability of blockchain technology can be facilitated through this collaboration, which allows stakeholders to share knowledge, experience, and best practices.

Lastly, to further improve blockchain's capacity to increase supply chain transparency, auxiliary technologies like the IoT and AI can be utilized. A combination of the IoT's real-time product tracking capabilities and AI's ability to sift through massive amounts of data in quest of patterns and trends that may indicate supply chain problems is possible. A supply chain system that is both transparent and intelligent, able to respond to changes in the market, can be created by integrating these technologies with blockchain. The strategy's long-term advantages, such as enhanced operational efficiency and increased consumer trust, can give stakeholders in the fashion industry a substantial return on investment. However, it does require an upfront investment in infrastructure and technology.

CONCLUSION

Finally, this research addresses the problem statement by affirming that blockchain technology indeed possesses a substantial capability to enhance transparency within the supply chain of the fashion industry. The capacity to document, authenticate, and uphold an unchangeable log of transactions has demonstrated significant promise in addressing current obstacles in product transparency. The research findings indicate that the implementation of blockchain technology in the fashion industry allows for an unparalleled level of transparency in the supply chain. This encompasses the capacity to track the source of materials, manufacturing procedures, distribution, and sales transactions. The findings validate the significant impact of blockchain technology in promoting consumer confidence and guaranteeing adherence to ethical and sustainable industry norms. The results have a substantial effect on how we think about and do things in the areas of governance, blockchain, and enterprise architecture. Within the realm of enterprise architecture, the discoveries provide fresh perspectives on incorporating blockchain technology into current systems to enhance transparency and operational effectiveness. Blockchain research validates the principles of decentralization and system robustness. Additionally, it demonstrates how technology can facilitate compliance and sustainability in governance. This study acknowledges certain constraints. The researchers recognize the necessity for additional research to investigate the

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implementation of blockchain on a broader scope and in diverse cultural settings. Further investigation focusing on longitudinal analysis and comprehensive case studies has the potential to enhance comprehension of how this technology is adopted and utilized in daily practical situations. Furthermore, it is crucial to evaluate the long-term economic consequences of implementing blockchain technology to offer more definitive guidance to professionals.

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