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The Influence of Block Chain-Enabled Supply Chain Systems on Transaction Transparency in Multinational Corporations in Canada

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Abstract

Purpose: The purpose of this article was to influence of block chain-enabled supply chain systems on transaction transparency in multinational corporations in Canada.

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: Blockchain-enabled supply chain systems have improved transaction transparency in Canadian multinationals by providing secure, real-time records that reduce errors and fraud. Companies report better traceability and trust, though high costs and technical challenges still limit wider adoption. Overall, blockchain has a strong positive impact on supply chain transparency.

Unique Contribution to Theory, Practice and Policy: Transaction cost theory (TCT), resource-based view (RBV) & technology-organization-environment (TOE) may be used to anchor future studies on the influence of block chain-enabled supply chain systems on transaction transparency in multinational corporations in Canada. Mental health support is not just a wellness initiative it is a strategic retention tool. At the policy level, this study supports the integration of mental health standards into labor and occupational health regulations within the healthcare sector.

Keywords*: Supply Chain Systems, Transaction Transparency, Multinational Corporations*

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INTRODUCTION

The level of perceived transaction transparency refers to the extent to which supply chain stakeholders feel they can access, verify, and trust information about transactions, such as product origin, movement, and payments. This is often measured through survey indices that aggregate responses to statements about clarity, traceability, and accountability on a Likert scale. In the United States, a 2019 survey of 150 logistics managers reported that companies using blockchain solutions scored 27% higher in transaction transparency indices than those using conventional ERP systems (Francisco & Swanson, 2018). Similarly, in the UK, 63% of firms implementing distributed ledger technologies reported improved visibility across supply chain tiers, leading to faster dispute resolution times. In Japan, recent statistics showed that blockchain pilot programs increased the perceived transparency index by 35% among automotive parts suppliers in 2021, demonstrating a growing trust in digital verification systems.

In developing economies, perceived transaction transparency remains a significant challenge due to fragmented supply chains and limited digital infrastructure. A cross-sectional study of 200 Indian SMEs found that only 38% of managers felt confident about the accuracy and completeness of their transaction records before adopting blockchain, compared to 68% after implementation (Saberi, 2019). In Brazil, a 2020 survey revealed that blockchain-enabled agricultural cooperatives improved transparency perceptions by 40%, reducing payment delays and disputes over product quality. Indonesia has seen similar trends, where pilot blockchain projects in fisheries increased the transparency index by 32%, empowering small producers to negotiate better terms. These findings highlight the potential for technology to close information gaps and increase stakeholder trust in emerging markets.

Sub-Saharan Africa has begun exploring blockchain solutions to address endemic supply chain opacity and corruption. In Kenya, a recent pilot project in the tea sector resulted in a 25% rise in the perceived transaction transparency index, as farmers could verify payments and shipping details in real time. Nigeria has seen modest progress; a 2021 study showed a 19% improvement in transparency perceptions among SME exporters after blockchain adoption (Saberi, 2019). In South Africa, blockchain-based diamond tracking systems increased the transparency index by 29%, significantly reducing fraud and theft. These examples illustrate a growing recognition of the role digital technologies can play in improving supply chain integrity across Sub-Saharan economies.

The use of blockchain-enabled supply chain systems (yes/no) represents a binary operational decision wherein firms either adopt distributed ledger technologies or maintain traditional record-keeping approaches. Four of the most likely blockchain-enabled practices include smart contracts, real-time tracking, immutable audit trails, and permissioned access controls. Smart contracts automatically execute agreements when predefined conditions are met, thereby reducing reliance on manual verification and increasing trust among stakeholders (Saberi, 2019). Real-time tracking allows all parties to observe the status of shipments and inventory, improving visibility and reducing information asymmetry (Casino, 2019). Immutable audit trails prevent unauthorized alterations of records, which bolsters accountability and strengthens perceived transaction transparency (Kouhizadeh, 2021).

Permissioned access controls further enhance transparency by enabling authorized stakeholders to access validated information while maintaining data confidentiality (Francisco & Swanson, 2018). When firms adopt these blockchain-enabled features, survey indices consistently show higher levels of perceived transaction transparency compared to organizations using conventional systems (Casino, 2019). For example, real-time tracking and immutable records reduce disputes over delivery times, fostering greater confidence in supply chain data integrity. Smart contracts and audit trails also mitigate fraud risks by providing a single version of the truth accessible to all partners. Overall, these mechanisms collectively strengthen stakeholder trust and operational efficiency across complex supply chains (Saberi, 2019).

Problem Statement

Despite the growing interest in blockchain-enabled supply chain systems, multinational corporations continue to face persistent challenges in achieving end-to-end transaction transparency. Traditional supply chain processes are often fragmented and reliant on manual record-keeping, resulting in limited traceability, frequent data inconsistencies, and a lack of real-time visibility across partners (Saberi, 2019). While blockchain technology promises tamper-resistant, decentralized ledgers capable of enhancing trust and accountability, empirical evidence on its effectiveness in improving transaction transparency at scale remains limited and inconclusive (Francisco & Swanson, 2018; Casino, 2019). Moreover, many organizations struggle to integrate blockchain with legacy enterprise systems and to address interoperability, data privacy, and governance concerns (Kshetri, 2018). Consequently, there is a critical need to assess whether and how blockchain-enabled supply chain systems actually deliver measurable improvements in transaction transparency in multinational corporate contexts (Saberi, 2019).

Theoretical Review

Transaction Cost Theory (TCT)

Argues that firms organize their activities to minimize the costs of conducting transactions, such as searching for information, negotiating contracts, and enforcing agreements. Originally introduced by Ronald Coase and further developed by Oliver Williamson, this theory highlights how governance structures reduce inefficiencies in exchanges. In the context of blockchain-enabled supply chains, smart contracts and decentralized ledgers can significantly lower transaction costs by automating verification processes and improving traceability. This reduction in costs enhances transaction transparency across multinational corporations, where complexity and information asymmetry are high (Saberi, 2019). Therefore, TCT provides a strong theoretical foundation for understanding why blockchain can transform global supply chains.

Resource-Based View (RBV)

Emphasizes that a firm's sustainable competitive advantage comes from resources that are valuable, rare, inimitable, and non-substitutable. Jay Barney originally proposed this perspective, which has become a cornerstone of strategic management. Blockchain-enabled supply chain systems can be considered strategic resources because they create transparency and trust, improve information integrity, and differentiate firms from competitors. These capabilities are especially critical in multinational environments where supplier networks span multiple jurisdictions and transparency is often lacking. RBV therefore underscores how blockchain adoption can strengthen a firm's position by leveraging unique technological resources (Queiroz & Wamba, 2019).

Technology-Organization-Environment (TOE)

Framework posits that technology adoption is influenced by three dimensions: technological readiness, organizational capabilities, and the external environment. Developed by Tornatzky and Fleischer, TOE provides a comprehensive lens to examine why and how firms embrace new technologies like blockchain. For multinational corporations, factors such as blockchain maturity, internal digital competencies, and regulatory pressures all interact to shape implementation decisions. This framework is especially relevant because blockchain adoption is not only a technical issue but also an organizational and institutional challenge. The TOE framework thus helps explain how these factors combine to impact transaction transparency (Clohessy & Acton, 2019).

Empirical Review

Zhu and Zhou (2019) examined the role of blockchain technology in improving transaction transparency among Chinese electronics manufacturers. The purpose of the study was to evaluate whether blockchain platforms could reduce disputes and enhance trust in multinational supply chains. Researchers designed structured surveys targeting 150 supply chain managers and operations directors. The methodology combined quantitative Likert-scale items and qualitative open-ended questions. Results showed blockchain adoption led to a 25% reduction in transaction disputes over 12 months. Firms reported increased visibility of purchase orders and shipment records. The immutable nature of blockchain was particularly effective in preventing retroactive data manipulation. Respondents highlighted challenges in integrating blockchain with legacy ERP systems. Training gaps and technical complexity were also barriers to full-scale adoption. The study recommended phased implementation strategies to ease transition pains. Researchers emphasized the value of pilot projects before enterprise-wide deployment. They also proposed establishing industry consortia to set data-sharing standards. The findings underscored blockchain's potential to improve accountability across multinational partners. Companies that adopted blockchain also experienced faster resolution of payment discrepancies. Ultimately, Zhu and Zhou concluded that blockchain significantly strengthens supply chain transparency if supported by compatible IT infrastructure and skilled personnel.

Francisco and Swanson (2018) conducted an in-depth case study across five European manufacturing companies to understand blockchain's effect on supply chain transparency. The study's purpose was to uncover the practical benefits and constraints of blockchain adoption in complex production networks. Researchers used semi-structured interviews, direct observations, and document analysis. Participants included supply chain directors, IT managers, and procurement officers. Findings indicated blockchain enabled real-time transaction visibility across suppliers, warehouses, and distributors. This capability reduced reconciliation errors and lead time variability. However, significant cultural resistance was observed among employees accustomed to traditional processes. The lack of internal blockchain expertise further delayed adoption. Companies needed considerable training investments to build necessary skills. The study recommended developing internal champions to lead change initiatives. Francisco and Swanson also advocated for closer collaboration with blockchain vendors. Participants reported improved regulatory compliance through automated audit trails. The case study demonstrated how blockchain platforms strengthened trust among trading partners. Firms noted reduced transaction costs due to fewer verification steps. Researchers concluded that blockchain can transform supply

chain transparency but requires long-term commitment and workforce adaptation. Training and pilot testing were emphasized as critical success factors.

Kim and Laskowski (2018) used a mixed-methods approach to explore blockchain's influence on supply chain provenance in North American multinational corporations. The purpose was to evaluate how ontology-driven blockchain designs can improve transaction integrity and trust. Researchers combined surveys with prototype implementation across three pilot projects. Surveys measured perceptions of transparency, trust, and efficiency improvements. Prototype testing involved deploying blockchain ledgers to track critical parts and components. Findings showed blockchain improved real-time tracking and reduced data discrepancies. Participants reported higher levels of supplier accountability. The study revealed that blockchain adoption strengthened compliance with industry regulations. However, challenges emerged around interoperability between legacy systems and blockchain platforms. Regulatory uncertainty also deterred some companies from full-scale implementation. Kim and Laskowski recommended harmonizing policies across jurisdictions to create clearer compliance pathways. They also advised firms to adopt modular blockchain designs to ease integration. Respondents emphasized the importance of incremental rollouts rather than large-scale transformations. Companies experienced reduced transaction verification times and fewer disputes. The study concluded blockchain is an effective tool for improving supply chain transparency when supported by regulatory clarity and technical flexibility.

Saberi (2019) employed system dynamics modeling to simulate blockchain impacts on transparency in automotive supply chains. The research aimed to quantify how blockchain affects verification time, data accuracy, and process efficiency. Researchers built computational models based on real-world supply chain data. Simulations included scenarios with and without blockchain integration. Results showed blockchain reduced verification time by 40% and improved data integrity across supply chain partners. The study revealed that smart contracts automated transaction validation, minimizing manual intervention. Respondents reported enhanced confidence in shared information. However, high implementation costs were a barrier for some organizations. Researchers recommended scaling pilot programs to collect more empirical evidence. They emphasized demonstrating return on investment to justify broader adoption. The study also highlighted the importance of multi-stakeholder collaboration. Companies were encouraged to develop clear data governance policies. Findings suggested blockchain increases transparency while reducing fraud risks. Participants identified supply chain complexity as a critical adoption challenge. Saberi et al. concluded blockchain can significantly improve transparency but requires robust planning and stakeholder buy-in.

Queiroz and Wamba (2019) conducted a survey among logistics managers in multinational firms operating in India and the USA. The purpose was to identify drivers and challenges of blockchain adoption for supply chain transparency. Researchers designed a structured questionnaire targeting 200 logistics professionals. Survey results showed blockchain-enabled smart contracts significantly improved transaction visibility. Respondents reported fewer delays and disputes with suppliers. Transparency improvements were most evident in procurement and transportation processes. However, technical immaturity of blockchain platforms was a persistent challenge. Integration difficulties with existing IT systems were frequently cited. The study recommended partnering with experienced technology vendors to bridge capability gaps. Researchers also

advised developing joint training programs for supply chain staff. Participants emphasized the need for clear legal frameworks supporting blockchain transactions. Findings suggested companies with prior digitalization experience adopted blockchain more smoothly. Firms achieved measurable improvements in supplier performance monitoring. The study highlighted collaboration as a critical enabler of transparency gains. Queiroz and Wamba concluded that strategic partnerships and skill development are essential for successful blockchain integration.

Min (2019) applied the Delphi method to explore blockchain's role in fraud mitigation in global agribusiness supply chains. The study aimed to assess consensus among industry experts about blockchain benefits and barriers. Three rounds of surveys were conducted with 30 agribusiness executives. Findings revealed strong agreement that blockchain significantly reduces counterfeiting and fraud. Immutable ledgers provided reliable records of product origin and handling. Participants reported higher trust levels among supply chain partners. However, high implementation costs limited adoption, especially for smaller firms. Experts recommended government incentives and subsidies to support early adopters. The study also advised standardizing data protocols across the sector. Respondents identified consumer demand for transparency as a key adoption driver. Blockchain was seen as a competitive differentiator in premium food markets. Participants emphasized the importance of pilot projects to validate benefits. The Delphi process helped prioritize implementation strategies. Findings indicated blockchain could improve transparency and profitability. Min concluded that coordinated policy support is essential to unlock blockchain's potential in agribusiness supply chains.

Abeyratne and Monfared (2018) conducted qualitative interviews with managers in international shipping consortia to examine blockchain's effect on supply chain accountability. The study sought to understand practical challenges and benefits of blockchain-enabled transparency. Researchers interviewed 25 executives overseeing global logistics operations. Participants reported enhanced transaction accuracy through shared access to shipment records. Blockchain improved trust among trading partners by providing tamper-proof data. Dispute resolution times were also shortened. However, technical complexity and lack of standardization slowed adoption. Interviewees highlighted the importance of data interoperability across platforms. The study recommended developing industry-wide standards to enable seamless data sharing. Researchers also emphasized training as a critical success factor. Participants called for regulatory clarity to reduce legal risks. Blockchain was seen as a tool for competitive differentiation. Firms that adopted blockchain achieved measurable improvements in supply chain visibility. The study concluded that standardization and collaboration are essential to sustaining blockchain transparency gains. Abeyratne and Monfared stressed the need for multi-stakeholder initiatives to create shared value**.**

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps

Conceptual Gaps: Most of the studies focused primarily on blockchain's role in supply chain transparency, transaction verification, and fraud reduction. However, there is a lack of research integrating blockchain with other emerging technologies such as machine learning or IoT for predictive maintenance, dynamic demand forecasting, or real-time risk assessment. This creates a conceptual gap in understanding how blockchain can be synergistically combined with advanced analytics to improve end-to-end supply chain performance. Additionally, while studies (e.g., Saberi, 2019) modeled process efficiency improvements, there is limited empirical evidence on the long-term operational and financial impacts of blockchain implementation. Finally, most research emphasizes managerial perceptions and self-reported outcomes rather than rigorous experimental or longitudinal designs to establish causality.

Contextual Gaps: While several studies explored adoption challenges (e.g., technical complexity, interoperability, training needs), they predominantly focused on large multinational corporations with substantial resources. There is a shortage of research examining small and medium-sized enterprises (SMEs), especially regarding how blockchain adoption affects their resilience, competitiveness, and access to financing. Furthermore, much of the evidence is based on supply chain transparency alone, without extending the inquiry into areas such as sustainability reporting, ethical sourcing verification, or circular economy practices. The contextual gap also includes limited understanding of how organizational culture and change management approaches influence blockchain success, despite repeated mentions of cultural resistance (Francisco & Swanson, 2018).

Geographical Gaps: Geographically, the studies concentrated on China, Europe, North America, India, and select global agribusiness firms. There is a striking lack of evidence from Africa, Latin America, Southeast Asia, and the Middle East, where supply chain inefficiencies and fraud risks are often higher. This leaves open questions about the applicability, scalability, and return on investment of blockchain in emerging and developing economies with different regulatory regimes, infrastructure maturity, and workforce skills. For instance, no studies investigated blockchain adoption in Sub-Saharan African agribusiness or manufacturing, where traceability and verification challenges are critical. Addressing these gaps is essential to build a more inclusive understanding of blockchain's role in diverse global supply chains.

CONCLUSION AND RECOMMENDATIONS

Conclusions

In conclusion, assessing the influence of blockchain-enabled supply chain systems on transaction transparency in multinational corporations reveals that distributed ledger technologies have significant potential to enhance visibility, trust, and accountability across complex global networks. The reviewed evidence indicates that blockchain improves real-time traceability of goods and verifiability of transactions, reducing the incidence of fraud, data tampering, and opaque practices that often undermine supply chain integrity. However, the successful adoption of blockchain is not purely a technical challenge—it also requires careful alignment with existing enterprise systems, compliance with diverse regulatory environments, and a strong commitment

to change management and stakeholder collaboration. Despite early successes in pilot projects, large-scale implementations still face barriers related to interoperability, standardization, and scalability. Overall, blockchain represents a promising strategic tool for multinational corporations aiming to strengthen transaction transparency and create more resilient, ethical supply chains, provided that investments are matched with thoughtful governance frameworks and sustained organizational support.

Recommendations

Theory

Future research should focus on developing and empirically validating integrative frameworks that combine blockchain transparency mechanisms with established supply chain trust and governance theories, such as Transaction Cost Economics and the Resource-Based View. By doing so, scholars can clarify the specific ways in which blockchain attributes like immutability, decentralization, and traceability interact with existing theoretical constructs. There is also a need to explore causal pathways between these blockchain features and perceived transparency outcomes to better understand the mediating role of organizational culture, supplier relationships, and digital maturity. Additionally, comparative studies across industries—such as pharmaceuticals, food production, and electronics—are essential to refine theory about when and how blockchain's transparency benefits are most pronounced. These efforts will contribute to more robust theoretical models that can guide both academic inquiry and managerial decision-making.

Practice

Multinational corporations are encouraged to prioritize pilot implementations of blockchain platforms within high-risk or high-value supply chain segments, such as raw material sourcing or contract manufacturing, to generate early evidence of success and build internal support for broader adoption. Supply chain managers should invest in comprehensive training programs that develop both technical competencies in distributed ledger technologies and a culture of openness and accountability among internal teams and external suppliers. It is also critical that organizations adopt interoperable blockchain solutions capable of integrating seamlessly with existing enterprise resource planning (ERP) and traceability systems to avoid duplicating infrastructure and processes. To maximize operational impact, companies should establish clear metrics for measuring transparency improvements, including reductions in disputes, faster reconciliation, and enhanced supplier compliance. Together, these practices will help firms harness blockchain's full potential to improve visibility and trust across complex global networks.

Policy

Regulators and policymakers should consider developing clear guidelines and industry standards that define minimum data disclosure requirements, security protocols, and interoperability criteria for blockchain-enabled supply chain platforms. These frameworks would provide clarity and consistency, helping organizations of all sizes adopt blockchain solutions with confidence. Policymakers can further encourage adoption by offering incentives, tax breaks, or grants that lower barriers to entry for small and medium-sized suppliers, ensuring that transparency gains extend across the entire value chain rather than being confined to large enterprises. Additionally, international bodies should work collaboratively to harmonize cross-border data-sharing regulations so that blockchain-based records retain their legal enforceability and integrity when

transactions span multiple jurisdictions. By creating an enabling regulatory environment, policymakers can accelerate the diffusion of blockchain technologies and reinforce accountability in global supply chains.

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