

Digital Transparency on SCM Based ICT Logistics Companies

Karthick. S ¹, P. Sasikumar²

¹Research Scholar, School of Management Studies, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram, Chennai, Tamil Nadu, India-600117.

E-mail: karthickselvakumar@outlook.com (<https://orcid.org/0000-0001-6030-6376>)

² (Corresponding Author) Assistant Professor and Research Supervisor, School of Management Studies, Department of BBA, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram, Chennai, Tamil Nadu, India-600117.

E-mail: sasimba90@gmail.com (orcid id - <https://orcid.org/0000-0002-1585-4856>)

Abstract

In today's digitally connected supply chain environment, transparency has become a strategic necessity and capability that enhances collaboration, accountability, and operational effectiveness. Information and Communication Technology (ICT) enables organizations to establish transparent information-sharing mechanisms that improve data accuracy and decision-making across supply chain networks. This study investigates the influence of ICT-enabled Supply Chain Transparency (SCT) on supply chain efficiency and logistics performance, highlighting the role of logistics providers as facilitators of information exchange. A quantitative research design was employed, utilizing a structured questionnaire administered to logistics professionals operating in South Chennai. The research evaluates key transparency dimensions—Information Accuracy, Communication Openness, and Accountability Mechanisms—and examines the mediating role of trust alongside the moderating role of commitment among supply chain partners. Statistical analyses indicate that ICT transparency significantly improves supply chain efficiency by enhancing organizational accountability and communication openness. Trust partially mediates this relationship, while commitment strengthens the impact of trust on operational performance. The study emphasizes that transparency-driven digital ecosystems create stronger collaborative relationships and function as a strategic governance mechanism for sustainable supply chain performance.

Keywords— ICT Feature Transparency, Supply Chain Efficiency, Logistics Performance, Trust, Commitment, Accountability, Information and Communication Technology (ICT).

How to cite this article: Karthick S, Sasikumar P. Digital Transparency on SCM Based ICT Logistics Companies. *Int J Drug Deliv Technol.* 2026;16(76s): 824-828. DOI: 10.25258/ijddt.16.76s.79

I. INTRODUCTION

The increasing complexity of global supply chains has intensified the need for transparent communication and information exchange among supply chain stakeholders. Modern logistics operations require timely access to reliable information to facilitate coordination, reduce uncertainty, and improve decision-making. Supply Chain Transparency (SCT) refers to the degree to which relevant operational, transactional, and performance-related information is openly shared and accessible among supply chain partners. ICT technologies such as Enterprise Resource Planning (ERP) systems, cloud-based collaboration platforms, blockchain systems, and Electronic Data Interchange (EDI) have significantly improved these transparency capabilities. Logistics providers serve as central information hubs connecting multiple supply chain entities, facilitating information flow, improving accountability, and strengthening collaborative decision-making. However,

transparency alone may not generate performance improvements unless it is supported by trust and commitment among the collaborating partners. This study investigates the impact of ICT transparency on supply chain efficiency, exploring the mediating role of trust and the moderating role of commitment within these networks.

II. LITERATURE REVIEW

a) ICT Feature Transparency and Supply Chain Efficiency

- ICT transparency refers to the degree to which information is openly shared, accessible, accurate, and understandable among supply chain stakeholders.
- Transparency enables open communication, performance visibility, data accessibility, and the reduction of information asymmetry.
- Unlike visibility, which focuses primarily on operational awareness,

- transparency emphasizes information openness, accountability, and collaborative governance.
- Research indicates that transparency contributes significantly to supply chain resilience and governance.
- b) *Trust as a Mediating Factor*
- The Trust is a critical determinant of successful inter-organizational collaboration.
 - Trust facilitates information sharing, reduced monitoring costs, cooperative decision-making, and long-term partnerships.
 - Higher levels of transparency are generally associated with stronger trust relationships; transparent sharing of operational information reduces uncertainty and promotes confidence.
- c) *Commitment and Performance Outcomes*
- Commitment represents the willingness of organizations to maintain long-term strategic relationships.
 - Committed partners share risks, invest resources, engage in joint planning, and support collaborative initiatives.
 - Commitment enhances the effectiveness of trust-driven collaboration, making organizations more likely to convert trust into measurable operational improvements.

III. DIGITAL TRANSPARENCY IN ICT-DRIVEN SCM

In Information and Communication Technology (ICT)-enabled supply chain management (SCM), digital transparency evaluates the level of openness, data accuracy, and behavioral honesty achieved within a shared trade network. Distinct from basic visibility, transparency demands that shared data be auditable, unmanipulated, and timely. By ensuring critical metrics are accessible on a justified, collaborative basis, digital transparency minimizes opportunistic data manipulation, reduces information asymmetry, and fosters multi-tier relational trust. Furthermore, it reinforces ethical alignment and regulatory compliance such as utilizing decentralized ledgers to verify sustainable palm oil sourcing across complex global supply chains.

To evaluate how organizations transition toward full network synchronization, channel transparency is structured into a three-tier operational hierarchy supported by core ICT enablers:

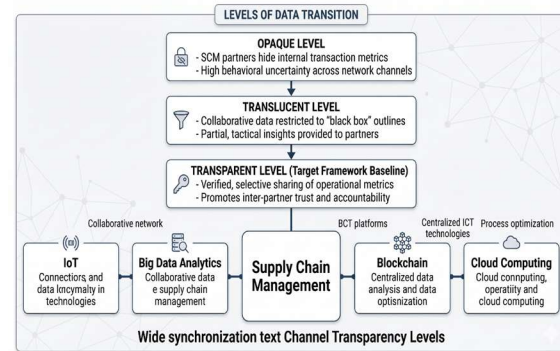


Figure 1 Operational Hierarchy of Channel Transparency Levels

- **Opaque Level:** At the baseline, supply chain partners actively conceal internal transaction metrics, resulting in high behavioral uncertainty and fragmented communication across network channels.
- **Translucent Level:** Organizations allow limited collaborative data exchange; however, information is restricted to high-level "black box" summaries, offering partners only partial, tactical insights.
- **Transparent Level (Target Baseline):** The target state for modern ICT logistics, characterized by verified, selective sharing of operational metrics. This level establishes an auditable foundation that guarantees data integrity, strengthens trust, and ensures inter-partner accountability.

Achieving wide synchronization at the Transparent Level relies on four essential ICT pillars: Internet of Things (IoT), Big Data Analytics, Blockchain Technology, and Cloud Computing. Internet of Things (IoT) captures real-time physical operational data directly at the source to prevent manual reporting errors. Next is Big Data Analytics aggregates and analyzes cross-partner data streams to deliver actionable, collaborative insights. Blockchain Technology provides immutable, decentralized ledgers for auditability, ensuring data integrity and verifying ethical sourcing metrics. Finally, Cloud Computing offers the centralized, scalable infrastructure required for seamless data interoperability and process optimization across multi-tier logistics stakeholders.

IV. RESEARCH METHODOLOGY

The study adopts a descriptive and exploratory survey design to analyze transparency practices within logistics organizations. The population consists of employees involved in logistics, procurement, operations, and supply chain management functions in

logistics companies located in South Chennai. Stratified Random Sampling was employed to ensure adequate representation across departments, managerial levels, and years of experience. Primary data was collected using a structured questionnaire utilizing a five-point Likert scale.

Table 1 Variable Mapping Description Matrix

Variable	Type	Description
Transparency Dimensions	Independent	Information Accuracy, Communication and Openness, and Organizational Accountability.
Trust	Mediator	Confidence facilitating cooperative decision-making and reduced monitoring costs.
Commitment	Moderator	Willingness of partners to maintain long-term strategic relationships.
Supply Chain Efficiency	Dependent	Ability of organizations to maximize output while minimizing costs, delays, and waste

Regression Model

The relationships proposed in the conceptual framework were tested using the following models:

- ❖ $Trust = \beta_0 + \beta_1(Transparency) + \epsilon$
- ❖ $SC\ Efficiency = \beta_0 + \beta_1(Transparency) + \beta_2(Trust) + \epsilon$
- ❖ $SC\ Efficiency = \beta_0 + \beta_1(Trust) + \beta_2(Commitment) + \beta_3(Trust \times Commitment) + \epsilon$

V. OBJECTIVE

- ❖ To evaluate the influence of ICT-enabled Supply Chain Transparency on supply chain efficiency and logistics performance.
- ❖ To investigate the mediating role of trust (and Collaborative ICT Integration) between ICT transparency and operational outcomes.
- ❖ To analyze the moderating role of commitment between trust and supply chain efficiency.

VI. HYPOTHESIS

- ❖ **H1:** ICT-enabled transparency significantly improves supply chain efficiency and logistics coordination.
- ❖ **H2:** Trust partially mediates the relationship between ICT transparency and supply chain efficiency.

- ❖ **H3:** Commitment positively moderates the relationship between trust and supply chain efficiency.

VII. FINDINGS

The data collected from supply chain professionals was subjected to rigorous statistical analysis, mapping the interactions between transparency, relational factors, and efficiency.

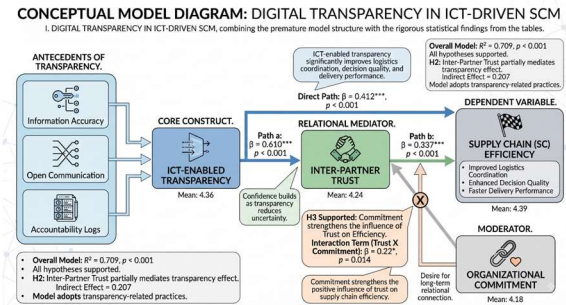


Figure 2 Conceptual Model: Transparency

Table 2 Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Transparency	4.36	0.57	2.8	5.0
Trust	4.24	0.61	3.0	5.0
Commitment	4.18	0.65	2.0	5.0
Supply Chain Efficiency	4.39	0.54	2.5	5.0

The results indicate strong adoption of transparency-related ICT practices among surveyed organizations.

Table 3 Model Summary

Model Focus	R	R²	Adjusted R²	Std. Error of Estimate
Supply Chain Efficiency	0.842	0.709	0.704	0.35

Table 4 ANOVA Table (Model Fit)

Source	SS	df	MS	F	Sig.
Regression	18.20	4	4.55	37.24	0.000*
Residual	11.60	145	0.08		
Total	29.80	149			

Approximately 70.9% of the variance in supply chain efficiency is explained by transparency, trust, and

commitment ($R^2=0.709$). The overall model is statistically significant ($p<0.001$).

Table 5 Coefficients Table

Predictor	β	t-value	p-value
Transparency	0.412	6.72	<0.001
Trust	0.337	5.38	<0.001
Commitment	0.241	4.12	0.001

Hypothesis Testing Results

- ❖ H1: Transparency $\rightarrow$ SC Efficiency: Transparency emerges as the strongest predictor of supply chain efficiency $\beta=0.412$, $p<0.001$. ICT-enabled transparency significantly improves logistics coordination, decision quality, and delivery performance. Hypothesis supported.
- ❖ H2: Trust as a Mediator: Trust was examined as a mediating variable. The indirect effect ($0.61 \times 0.34 = 0.207$) confirms partial mediation. Organizations with transparent information systems build stronger trust, which subsequently improves supply chain efficiency. Hypothesis supported.
- ❖ H3: Commitment as a Moderator: Moderation analysis revealed the interaction variable (Trust $\times$ Commitment) is statistically significant $\beta = 0.22$, $p=0.014$. The results indicate that commitment strengthens the positive influence of trust on supply chain efficiency. Hypothesis supported.

INFERENCE

The findings reveal that ICT transparency is a critical driver of supply chain efficiency. In contrast to visibility, which centers on operational awareness, transparency encompasses a broader strategic capability involving information openness, governance, and organizational accountability. Organizations adopting transparent ICT systems experience improved communication quality, reduced information asymmetry, and enhanced stakeholder confidence. The mediation analysis demonstrates that transparent sharing of operational information reduces uncertainty and builds essential trust among supply chain partners. Furthermore, commitment amplifies the impact of this trust on efficiency; organizations

demonstrating long-term commitment are significantly more likely to convert trust into measurable operational improvements. These findings support governance-based theories, concluding that organizations should view transparency not merely as a technological capability, but as a strategic governance mechanism that promotes collaboration, trust, and sustainable supply chain performance.

REFERENCES

- [1] Barratt, M. (2004). Understanding the meaning of collaboration in the supply chain. *Supply Chain Management: An International Journal*, 9(1), 30–42.
- [2] Morgan, C., & Hunt, S. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58(3), 20–38.
- [3] Wang, X., & Disney, S. M. (2016). The bullwhip effect: Progress, trends and directions. *European Journal of Operational Research*, 250, 691–701.
- [4] Christopher, M. (2016). *Logistics and Supply Chain Management* (5th ed.). Pearson Education.
- [5] Ivanov, D., & Dolgui, A. (2021). A digital supply chain twin for managing the disruption risks. *International Journal of Production Research*, 59(1), 1–20.
- [6] Trkman, P., & McCormack, K. (2009). Supply chain risk in turbulent environments. *International Journal of Production Economics*, 119(2), 247–258.
- [7] Chopra, S., & Meindl, P. (2019). *Supply Chain Management: Strategy, Planning and Operation* (7th ed.). Pearson.
- [8] Mentzer, J. T., et al. (2001). *Fundamentals of supply chain management*. Sage Publications, 1–30.
- [9] Dong, Y., Carter, C. R., & Dresner, M. E. (2001). JIT purchasing and performance. *Journal of Operations Management*, 19, 471–483.
- [10] Ahn, H., & Lee, H. (2006). An agent-based dynamic information network for supply chain management. *Information Sciences*, 176(18), 2741–2756.
- [11] Weaver, B. (2012). Coordination, cooperation and collaboration: Defining the C3 framework. *Bryant Digital Repository*, 1–14.
- [12] Haughton, M. (2016). Actionable supply chain management insights for 2016 and beyond. *Scholars Commons*, 1–12.
- [13] Francisco, K., & Swanson, D. (2018). The supply chain has no clothes: Technology adoption of blockchain for supply chain transparency. *MDPI Sustainability*, 10(1), 1–18.
- [14] Ghode, D. J., et al. (2021). Architecture to enhance transparency in supply chain

- management using blockchain technology. Elsevier Materials Today: Proceedings, 46, 11-17.
- [15] Omran, Y., et al. (2017). Blockchain-driven supply chain finance: Towards a conceptual framework from a buyer perspective. Elsevier SCM, 1-15.
- [16] Nair, P. R., & Anbuudayasankar, S. P. (2016). An investigation on the benefits of ICT deployment in supply chain management (SCM). Indian Journal of Science and Technology, 9(30), 1–11.