



EVALUATING LOGISTICS NETWORK EFFICIENCY THROUGH REAL-TIME ANALYSIS

D. Suganya* & B. Rahul**

* Assistant Professor, Department of MBA, Sri Ramakrishna College of Arts & Science, Coimbatore, Tamil Nadu, India

** Student, Department of MBA, Sri Ramakrishna College of Arts & Science, Coimbatore, Tamil Nadu, India

Cite This Article: D. Suganya & B. Rahul, "Evaluating Logistics Network Efficiency Through Real-Time Analysis", International Journal of Multidisciplinary Research and Modern Education, Volume 12, Issue 1, January - June, Page Number 29-31, 2026.

Copy Right: © Crystal Pen Publication, 2026 (All Rights Reserved). This is an Open Access Article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Type of Review: Peer Reviewed as per |C|O|P|E| Guidance.

Disclaimer: The scholarly papers reviewed and published by Crystal Pen Publication, India, reflect the views and opinions of their respective authors and do not necessarily represent the views or opinions of Crystal Pen Publication. The publisher disclaims any responsibility for any harm, loss, or damage resulting from the use of the published content by any party.

DOI: <https://doi.org/10.5281/zenodo.18710191>

Abstract:

In the modern business ecosystem, logistics has evolved from a support function into a strategic driver of operational success. This study, titled "Evaluating Logistics Network Efficiency through Real-Time Analysis", explores how real-time data analytics enhances logistics performance, improves decision-making, and promotes sustainability. Drawing upon empirical data collected from 30 professionals in the logistics and supply chain sector, the research examines key performance indicators (KPIs), technologies adopted, areas for improvement, and future advancements. The findings reveal that integrating technologies such as GPS tracking, IoT, and RFID significantly improves operational transparency and responsiveness. Furthermore, real-time analysis facilitates predictive maintenance, optimizes route planning, and enhances customer satisfaction. The study underscores that the future of logistics lies in the confluence of automation, artificial intelligence (AI), blockchain, and sustainability-driven analytics. By aligning with data-driven insights, organizations can achieve resilience, efficiency, and long-term competitiveness.

Key Words: Logistics Efficiency, Real-Time Analysis, Supply Chain Analytics, Predictive Maintenance, Blockchain, Internet of Things (IoT), Operational Resilience.

Introduction:

In a dynamic, data-intensive business environment, logistics serves as the backbone of trade and industrial operations. Efficient logistics networks ensure seamless coordination between procurement, transportation, warehousing, and distribution. The emergence of real-time analytics has revolutionized this domain, transforming logistics from reactive management to proactive optimization. By capturing, processing, and analyzing operational data instantaneously, organizations can predict disruptions, optimize routes, and enhance resource allocation.

The study emphasizes the growing role of data-driven decision-making in logistics. Predictive analytics, enabled by machine learning and AI, allows managers to anticipate market fluctuations and adapt swiftly to demand variations. This shift enhances organizational agility and reduces operational bottlenecks. Moreover, real-time decision support facilitates timely responses to challenges, improving cost control, customer satisfaction, and risk mitigation.

Industry Background:

The global logistics industry represents a critical infrastructure that connects production with consumption. Defined by the Council of Supply Chain Management Professionals (CSCMP), logistics encompasses the planning and control of goods, services, and information flow from origin to destination. With the integration of digital tools, logistics has transitioned into an ecosystem governed by data transparency, predictive control, and sustainability.

Evolution of the Logistics Sector:

Historically rooted in military operations, logistics gained commercial prominence during the industrial revolution. The globalization era introduced Just-in-Time (JIT) and lean manufacturing principles, where logistics efficiency directly influenced competitiveness. In the 21st century, Industry 4.0, automation, and the Internet of Things (IoT) have redefined logistics into a digitally intelligent network.

Technological Transformation:

Technologies such as GPS tracking, blockchain, and AI-driven analytics have shifted logistics from manual operations to autonomous systems. Real-time tracking provides visibility across the supply chain, while predictive analytics supports demand forecasting and inventory optimization. These advancements minimize lead times, reduce wastage, and enhance delivery precision.

In the Indian context, the logistics sector contributes nearly 14% to GDP and employs over 22 million people. Government initiatives like the National Logistics Policy (2022) and the PM Gati Shakti Master Plan aim to enhance multimodal connectivity and reduce logistics costs from 13- 14% of GDP to 8%. Real-time analytics plays a crucial role in achieving these national efficiency goals.

Company Overview:

The study centres on Spirit out Tourism, a dynamic travel and logistics management enterprise that integrates real-time operational analysis into its service ecosystem. The company operates across travel coordination, fleet management, and event logistics, using data analytics for route optimization, fleet tracking, and customer experience enhancement.

Spirit out Tourism's logistics network relies on technologies such as GPS-based fleet monitoring, RFID-enabled

tracking, and IoT connectivity. These systems enhance operational visibility and customer reliability. Its sustainability initiatives like paperless documentation, carbon-efficient transport, and digital resource optimization demonstrate a balance between operational excellence and environmental responsibility.

Statement of the Problem:

Despite technological growth, logistics systems still face inefficiencies in data visibility, real-time monitoring, and risk management.

- Limited visibility arises from fragmented information across departments, leading to delayed responses.
- Inefficient resource utilization results from poor demand forecasting and underused assets.
- Risk of disruptions stems from supplier dependency, cyber threats, and regulatory non-compliance.
- This research aims to analyze how real-time analytics can address these gaps by improving coordination, visibility, and responsiveness.

Objectives of the Study:

- To examine the role of real-time analytics in improving decision-making in logistics.
- To analyze process automation and optimization as tools for operational efficiency.
- To evaluate efficient resource allocation through continuous improvement practices.
- To identify the impact of agile operations on logistics responsiveness.
- To assess the contribution of technology-driven adaptability toward customer satisfaction.

Research Methodology:

The research employs a descriptive design, analyzing quantitative data collected through a structured questionnaire from 30 respondents working in supply chain and logistics operations across Tamil Nadu.

- Sampling Technique: Convenience sampling
- Tools Used: Percentage analysis and Chi-square tests
- Data Sources: Primary data (survey responses) and secondary data (academic publications, government reports, and industry whitepapers)
- Study Period: 2024- 2025

This mixed-method approach allowed for empirical validation of theoretical concepts relating to real-time logistics efficiency.

Data Analysis and Key Findings:

The findings provide critical insights into the technological and managerial dynamics of logistics efficiency:

Respondent Profile:

The survey covered logistics coordinators (43.3%), operations managers (30%), supply chain analysts (20%), and managers (6.7%). This ensured a balanced perspective between operational and strategic roles.

Technologies Used:

GPS tracking and IoT integration were predominant (43.3%), followed by RFID-enabled systems (20%). This confirms a strong technological foundation supporting real-time logistics visibility.

Areas for Improvement:

Respondents highlighted route optimization (20%), last-mile delivery (16%), and inventory tracking (14%) as key areas requiring real-time improvements. Enhancing supplier collaboration and predictive demand analytics emerged as major priorities.

Data Security and Communication:

Access control (46.7%) and strong encryption (30%) were common data security measures. Effective communication relied on a blend of messaging platforms and regular meetings (46.7%), emphasizing collaborative decision-making.

Performance Indicators:

Over 70% of respondents rated logistics efficiency at 8 or above on a 10-point scale, signifying strong operational performance. Additionally, 80% expressed satisfaction with the technology used, indicating successful adoption of digital tools.

Future Enhancements:

Blockchain for supply chain transparency (60%) and IoT-based monitoring (26.7%) were the most anticipated advancements, along with AI-driven predictive analytics and drone-based delivery solutions.

Discussion:

The integration of real-time analytics represents a paradigm shift in logistics management. By converting large volumes of operational data into actionable intelligence, organizations can respond to disruptions proactively and optimize the flow of materials and information. This digital transformation fosters transparency, speed, and sustainability, aligning with global best practices.

Furthermore, the study confirms that data-driven logistics networks outperform traditional models in adaptability and resilience. Technologies such as AI and blockchain not only enhance operational control but also contribute to corporate sustainability goals by reducing waste, fuel consumption, and emissions.

Findings and Suggestions:

- Real-time monitoring increases decision accuracy and reduces delays.
- Integration of AI and IoT improves predictive capabilities for risk management.
- Enhanced visibility and automation minimize human error.
- Blockchain can revolutionize documentation transparency and traceability.
- Employee training on data analytics tools is essential for maximizing technological benefits.
- Future research may focus on expanding sample size and incorporating cross-sectoral comparisons to strengthen the generalizability of findings.

Conclusion:

This study demonstrates that logistics efficiency is no longer limited to physical resource management but is increasingly

defined by digital intelligence. Real-time analytics empowers organizations to anticipate challenges, enhance customer satisfaction, and achieve sustainable growth. The convergence of technology, data, and strategic planning marks the next frontier of logistics innovation. As industries evolve toward smart logistics ecosystems, real-time analysis will remain the cornerstone of operational excellence and competitive advantage.

References:

1. Smith, J., et al. (2018). Real-Time Data Analytics in Logistics Management. *Journal of Operations Research*, 22(4), 415-429.
2. Ivanov, D., & Sokolov, B. (2019). The Role of Real-Time Visibility in Supply Chain Resilience. *International Journal of Production Economics*, 211, 123- 135.
3. Ruan, L., et al. (2021). Technological Enablers of Real-Time Logistics Analysis. *Supply Chain Innovation Journal*, 8(2), 64- 78.
4. Ghosh, A., & Bandyopadhyay, S. (2019). Transport Logistics and Tourism Efficiency in India. *Journal of Emerging Markets*, 7(3), 205- 218.
5. Lee, J., & Chen, H. (2021). Smart Logistics and Sustainable Tourism. *Tourism and Development Review*, 15(1), 55- 71.
6. Kowalski, M., & Rivera, P. (2019). Blockchain-Enabled Logistics Ecosystems. *Journal of Logistics Innovation*, 10(2), 144- 159.
7. Dr D Santhanakrishnan, (2021) "Choice Criterion of 4pl (Forth Party Logistics) Services in India, ANVESAK UGC Care Group 1 Journal, 0378 - 4568, 77-80
8. Dr D Santhanakrishnan, (2019) "A Study on the Survey of Third Party Logistics Services Companies In Tamilnadu", *International Journal of Multidisciplinary Research and Modern Education*, VOL 5 ,154
9. Santhanakrishnan, D. D. (2019). A Study on the Survey of Third Party Logistics Services Companies In Tamilnadu. *International Journal of Multidisciplinary Research and Modern Education*, 5, 154.
10. Santhanakrishnan, D., & Balakrishnan, H. (2016). Selection criteria of third party logistics services. *International Journal of Interdisciplinary Research in Arts and Humanities*, 1(1), 91-94.