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A STUDY ON COST OPTIMISATION IN INBOUND LOGISTICS (TIRUPUR)

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Abstract:

The study focuses on cost optimization in inbound logistics at Kiwi Clothing, a Tirupur-based apparel manufacturing firm specializing in knitted and woven garments for export markets. In today's competitive global textile industry, reducing operational costs while maintaining quality and timely delivery is crucial. The research explores how Kiwi Clothing can enhance efficiency in its inbound logistics processes, covering procurement, transportation, inventory management, and supplier coordination to minimize costs and strengthen overall supply chain performance.

Key Words: Inbound Logistics, Cost Optimization, Supply Chain Management, Textile Industry, Third-Party Logistics (3PL), Kiwi Clothing.

Introduction:

Inbound logistics involves activities such as sourcing, purchasing, transportation, warehousing, and supplier coordination. For manufacturing industries, especially in the apparel sector, optimizing these processes is essential to manage tight production schedules and fluctuating market demands.

The concept of cost optimization in inbound logistics focuses on identifying unnecessary expenditures, streamlining transportation routes, improving supplier communication, and adopting modern technologies to enhance visibility and control over the supply chain.

This study centers on Kiwi Clothing, a reputed garment manufacturer based in Tirupur, Tamil Nadu, known for producing high-quality knitted and woven garments for international clients. The company faces increasing pressure to balance cost efficiency with on-time delivery and ethical production standards. Hence, analyzing and improving its inbound logistics system becomes a vital step toward sustaining competitiveness in the global market.

Review of Literature:

- Martinez, L., & Perez, G. (2025): This paper analyzes the impact of trade agreements on maritime freight flows. The authors discuss how new trade agreements can alter shipping patterns, affecting demand for freight forwarding services and necessitating strategic adjustments in logistics planning and cost structures.
- Metin Türkay (2025): Typical fruit supply chains include several echelons such as farms, primary fruit-processing facilities (to produce main products), secondary fruit-processing facilities (to produce by-products), distribution centers, retailers, and consumers. This paper focuses on inbound logistics operations, particularly logistics planning for transporting fruits collected at farms to primary fruit-processing facilities. The study highlights the importance of efficient inbound transportation in reducing overall supply chain costs.
- Zhang, Y., & Lam, J. S. L. (2025): This study investigates the integration of blockchain technology in maritime logistics to enhance transparency and efficiency. The authors highlight that blockchain can streamline documentation processes, reduce fraud, and improve trust among stakeholders, leading to more secure and efficient freight forwarding operations.

Objectives of the Study:

- To evaluate the effectiveness of current transportation and freight strategies and recommend more economical alternatives such as consolidated shipments or multimodal transport.
- To assess and renegotiate contracts with logistics service providers for better freight rates, terms, and service levels.

Statement of the Problem:

Kiwi Clothing faces increasing challenges in managing inbound logistics efficiently, with rising transportation and fuel costs being the major cost drivers. Frequent delivery delays, inconsistent supplier coordination, and lack of system integration add to operational inefficiencies. The absence of a Just-In-Time (JIT) system and limited contract flexibility further increase logistics expenses.

These issues affect production flow, cost control, and timely delivery. Hence, the study aims to identify key cost drivers and propose strategies to optimize inbound logistics for better cost efficiency and improved operational performance.

Research Methodology:

A mixed-methods research design was adopted, integrating both quantitative and qualitative approaches. The quantitative data provides measurable and statistical insights into cost factors, performance metrics, and efficiency indicators. The qualitative data complements this by offering detailed understanding through employees' and stakeholders' experiences, opinions, and perceptions regarding cost optimization strategies.

This combination allows for a comprehensive view of both numerical trends and contextual understanding within inbound logistics operations.

Sampling Technique:

The study adopted stratified random sampling to ensure proportional representation of all relevant groups involved in inbound logistics activities. The population was divided into internal and external strata.

Internal respondents were selected from key functional departments, including procurement, logistics, and warehouse operations, as these units play a direct role in managing inbound logistics costs.

External respondents comprised stakeholders associated with the supply chain, including warehouse service providers, third-party logistics (3PL) providers, suppliers, and various transport service providers.

Data Analysis and Interpretation:

1. Primary Mode of Transport and Experience:

The study analyzed the relationship between employees' experience and the primary mode of transport used in inbound logistics. The objective is to determine whether experience influences the choice or effectiveness of transportation methods.

Hypotheses:

- Ho (Null Hypothesis): There is no significant association between experience and primary mode of transport.
- H1 (Alternative Hypothesis): There is a significant association between experience and primary mode of transport.

Chi-Square Test Analysis:

Value		df	Asymptotic Significance (2-sided)
Pearson Chi- Square	10.470a	9	0.314
Likelihood Ratio	10.013	9	0.349

Interpretation:

There is no significant association between experience and mode of transport. We fail to reject the null hypothesis.

2. Current Logistics Contracts and Age Group:

Hypotheses:

- Ho (Null Hypothesis): There is no significant difference in the distribution of contract review frequency between the two age groups.
- H1 (Alternative Hypothesis): There is a significant difference in the distribution of contract review frequency between the two age groups.

Statistics	Value
Grouping Variable	age1
Sample Sizes (N)	18-30 years = 2731-40 years = 13
Mean Ranks	18-30 years = 20.6531-40 years = 20.19
Mann-Whitney U	171.5
Wilcoxon W	262.5
Z-value	-0.134
Asymp. Sig.(2-tailed)	0.893
Exact Sig. [2(1-tailed Sig.)]*	0.909

Interpretation:

There is no statistically significant difference in how often logistics contracts are reviewed between the age groups. We fail to reject the null hypothesis.

Findings:

The findings reveal that road transportation (trucks) is the primary mode used for inbound logistics, with several shipments arriving partially loaded, indicating inefficiencies in load utilization. Statistical analysis shows no significant difference in delivery delays across respondent groups ($p = 0.63 > 0.05$), suggesting that delays occur randomly rather than being influenced by specific demographic or operational factors.

Awareness of multimodal transportation was found to be moderate, and a majority of respondents perceived that its adoption could enhance overall logistics efficiency. These findings indicate that Kiwi Clothing has the potential to reduce inbound logistics costs by implementing multimodal transport and consolidated shipment strategies.

Furthermore, the study shows that logistics contracts are typically reviewed annually or only when operational issues arise, with no significant association between contract review frequency and age group ($p = 0.893 > 0.05$). External survey results also indicate no significant relationship between:

- Openness to revising contract terms ($p = 0.123 > 0.05$)
- Preferred pricing models ($p = 0.185 > 0.05$)
- Handling of renegotiations ($p = 0.628 > 0.05$)
- Bundled service options ($p = 0.402 > 0.05$)
- Areas of improvement such as pricing or delivery performance ($p = 0.07 > 0.05$)

Suggestions:

- Based on the findings of the study, it is recommended that Kiwi Clothing:
- Adopt multimodal transportation and consolidated shipping practices to improve load utilization and reduce transportation costs.
- Strengthen supplier coordination and communication to minimize delivery delays and enhance inbound logistics efficiency.

- Implement Just-In-Time (JIT) or lean inventory systems to reduce inventory holding costs, avoid overstocking, and improve production flow.
- Conduct regular review and renegotiation of logistics contracts with service providers to secure competitive freight rates, improve service levels, and adapt to changing market conditions.

Conclusion:

The study on cost optimization in inbound logistics at Kiwi Clothing highlights the importance of efficient logistics management to sustain profitability and competitiveness in the global apparel market. The findings reveal that transportation and fuel surcharges are the primary cost drivers influencing inbound logistics expenses.

Although some operational inefficiencies persist such as partial shipments, delivery delays, and inconsistent supplier coordination the research shows significant cost reduction opportunities exist through:

- Better route planning
- Adoption of multimodal transport
- Contract renegotiations

Implementing these strategies can improve operational efficiency, reduce costs, and enhance the company's overall supply chain performance.

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