

A STUDY ON ANALYSIS OF DELIVERY DELAYS AND COST OPTIMIZATION IN FREIGHT FORWARDING OPERATIONS

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ABSTRACT

The study titled “A Study on Analysis of Delivery Delays and Cost Optimization in Logistics company. Chennai” focuses on identifying the major causes of delivery delays and analyzing their impact on logistics costs and operational efficiency. The study examines factors such as transportation bottlenecks, customs clearance delays, documentation errors, process gaps, and unforeseen disruptions affecting freight forwarding operations. The research adopted a descriptive research design using both primary and secondary data. Primary data were collected from 130 respondents through questionnaires, and data were analyzed using Simple ANOVA tests. The findings reveal that delivery delays increase detention charges, demurrage charges, warehousing expenses, and overall logistics costs. The study concludes that effective transportation planning, digital documentation, real-time tracking, and process improvements can reduce delays, optimize costs, and improve operational performance.

Keywords: Delivery Delays, Cost Optimization, Freight Forwarding Operations, Logistics Management, Supply Chain Efficiency.

INTRODUCTION

The logistics company in Chennai is a leading freight forwarding and supply chain management company that provides efficient logistics services for both domestic and international markets. Timely delivery and cost-effective operations are essential for maintaining customer satisfaction and business performance in the logistics industry. Effective freight forwarding operations require proper coordination in transportation, customs clearance, documentation, warehousing, and shipment tracking to ensure smooth cargo movement. However, delivery delays remain a major challenge due to factors such as transportation bottlenecks, customs clearance delays, documentation errors, process gaps, and unforeseen disruptions. These issues not only affect delivery schedules but also increase detention charges, demurrage charges, warehousing expenses, and overall logistics costs, reducing operational efficiency and profitability. Therefore, cost optimization has become an important focus for freight forwarding companies to remain competitive in the market. This study aims to identify the major causes of delivery delays and analyze their impact on cost optimization in freight forwarding operations at Logistics Pvt. Ltd., Chennai. By

understanding these factors, the organization can adopt better transportation planning, improve stakeholder coordination, implement digital documentation systems, utilize real-time tracking technologies, and enhance overall operational efficiency, customer satisfaction, and organizational performance.

STATEMENT OF THE PROBLEM

Delivery delays in freight forwarding operations create operational inefficiencies and increase overall logistics costs. Transportation bottlenecks, customs clearance delays, documentation errors, and unforeseen disruptions affect timely shipment movement. Poor coordination and process gaps reduce service efficiency and customer satisfaction. These issues lead to additional costs such as detention, demurrage, and warehousing expenses. Therefore, identifying the causes of delivery delays and improving cost optimization has become essential for organizational performance.

OBJECTIVES OF THE STUDY

- To identify the major causes of delivery delays in freight forwarding operations.
- To analyze the impact of delivery delays on logistics costs.
- To examine the freight forwarding process from booking to final delivery.
- To evaluate transportation and handling costs in operations.
- To suggest measures for improving operational efficiency and cost optimization.

LITERATURE REVIEW

Sharma and Khanna (2025) conducted a study on delivery delay management in global freight forwarding operations. The study examined the key operational factors contributing to transit delays, including port congestion, transportation inefficiencies, and documentation issues. It explained that delivery delays significantly increase logistics costs through demurrage, detention, and penalty charges. The findings revealed that proactive delay monitoring and route optimization are essential for cost-efficient freight forwarding operations. **Fernand Zandile (2025)** analyzed cost optimization strategy readopted international freight forwarders. The study highlights the effectiveness of digital tools such as transportation management system and real-time tracking in reducing operational costs. It explained that improved visibility helps freight forwarders anticipate delays and minimize cost overruns. The finding syndicated that technology-driven operation enhance both delivery reliability and cost control. **Patel and Mehra (2024)** conducted a study on the impact of port congestion on freight forwarding performance. The research explained that congestion at major ports leads to extended dwell time and delayed cargo movement. It highlighted that such delays increase storage costs and negatively affect customer satisfaction. The findings revealed that efficient port coordination is critical for reducing delivery delays and logistics expenses. **Singh and Verma (2024)** examined transportation-related delays in multimodal freight forwarding operations. The study explained that poor road connectivity, rail scheduling constraints, and limited air cargo capacity contribute to transit delays. It highlighted that inefficient mode selection increases overall freight costs. The findings suggested that optimized mode planning plays a key role in cost reduction. **Kaur and Nair (2023)** conducted a study on regulatory and customs-related delays in freight forwarding. The research explained that complex documentation procedures and inspection delays increase lead time uncertainty. It highlighted those regulatory inefficiencies result in higher administrative and compliance costs. **Gupta and Reddy (2023)** analyzed the relationship between delivery reliability and customer satisfaction in freight forwarding services. The

study explained that frequent delivery delays weaken customer trust and long-term business relationships. It highlighted that cost optimization efforts must focus on improving service reliability. The findings revealed that consistent delivery performance enhances competitive advantage. **Malhotra and Iyer (2022)** conducted a study on cost drivers in freight forwarding operations. The research explained that fuel price fluctuations, labor costs, and inefficient routing increase logistics expenses. It highlighted that delivery delays further amplify these costs through idle time and resource wastage. The findings emphasized the need for integrated cost optimization strategies.

RESEARCH METHODOLOGY

The study adopted a descriptive research design. Primary data were collected through structured questionnaires from 130 respondents using a simple random sampling method. Secondary data were collected from books, journals, websites, and company records. Statistical tools such as Simple Percentage Analysis, ANOVA, and Chi-Square tests were used for data analysis and interpretation.

RESEARCH DESIGN

Research design is a framework prepared for collecting, measuring, and analyzing data effectively. It helps in selecting suitable methods for obtaining relevant information and achieving research objectives. The present study adopted a descriptive research design to analyze delivery delays and cost optimization in freight forwarding operations.

DATA ANALYSIS

The analysis revealed that delivery delays are mainly caused by transportation bottlenecks, customs clearance delays, documentation errors, and unforeseen disruptions. The findings indicate that these delays increase detention charges, demurrage costs, warehousing expenses, and total logistics costs. ANOVA analysis showed a significant relationship between transportation bottlenecks and respondents' perceptions, while Chi-square analysis indicated a significant association between respondent characteristics and delivery disruptions.

ANOVA ANALYSIS

The ANOVA test is used to compare more than two groups to determine whether there is a significant difference between them. In this study, the test is used to examine whether transportation bottlenecks causing delivery delays differ among different age groups.

HYPOTHESIS:

(H₀): There is no significant difference between age groups and transportation bottlenecks causing delivery delays.

(H₁): There is a significant difference between age groups and transportation bottlenecks causing delivery delays.

Descriptive

	N	Mean	St. Deviation	St. Error	95%Confidence Intervalfor Mean	Minimum		Maximum
					Lower Bound	Upper Bound		
below25y	5	1.0000	.00000	.00000	1.0000	1.0000	1.00	1.00

ears								
25-35years	25	2.1600	.62450	.12490	1.9022	2.4178	1.00	3.00
		3.7143						
36-45years	70	5.0000	.59327	.07091	3.5728	3.8557	3.00	5.00
above45years	30		.00000	.00000	5.0000	5.0000	5.00	5.00
Total	130	3.6077	1.17794	.10331	3.4033	3.8121	1.00	5.00

Test of homogeneity Variances

Transport bottleneck

Leven Statistic	df1	df2	Sig.
27.243	3	126	.000

ANOVA

	Mosques	Do	Mean Square	F	Sig.
Between Groups	145.347	3	48.449	181.436	.000
Within Groups	33.646	126	.267		
Total	178.992	129			

INTERPRETATION:

The significance value obtained is 0.000, which is less than the 0.05 level of significance. Hence, the null hypothesis is rejected and it is concluded that age has a significant influence on transportation bottlenecks causing delivery delays. Further, the mean values show that perception increases from younger to older age groups. This indicates that higher age groups perceive transportation bottlenecks more strongly.

FINDINGS

1. Transportation bottlenecks highly contribute to delivery delays (57.69% – High & Very High).
2. Customs clearance delays significantly affect delivery schedules (55.38% – Often & Frequently).
3. Documentation errors contribute to delivery delays (54.61% – High & Very High).
4. Delivery delays increase detention, demurrage, and warehousing costs.
5. Process gaps and unforeseen disruptions reduce operational efficiency and increase total logistics cost.

SUGGESTIONS

1. The companies may improve transportation planning and coordination.
2. Digital documentation systems can be implemented to reduce errors.

3. Real-time shipment tracking may improve delivery performance.
4. Better information sharing among stakeholders should be maintained.
5. Process standardization and technology adoption can reduce delays and optimize costs.

CONCLUSION

The study concludes that delivery delays significantly affect cost optimization and operational efficiency in freight forwarding operations at Logistics compsnies Chennai. Transportation bottlenecks, customs clearance delays, documentation errors, and unforeseen disruptions increase logistics costs and reduce service performance. Effective coordination, process improvements, digital documentation, and real-time tracking technologies can improve efficiency, reduce delays, and enhance customer satisfaction and competitiveness in the logistics industry.

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