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Logistics Operations in National Fitting Ltd

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***Abstract:** This study explores the logistics operations at National Fitting Ltd., focusing on identifying key operational factors that affect efficiency and cost-effectiveness. The aim is to analyse the logistics processes through a detailed evaluation of key stages such as transportation, inventory management, and supply chain coordination. The methodology involves the use of descriptive statistics to provide an overview of logistics operations, followed by a one-way ANOVA to assess significant differences across various logistics dimensions. Results show that transportation efficiency and inventory turnover are significantly impacted by operational strategies. The study concludes that optimizing inventory management and improving coordination within the supply chain can lead to a reduction in logistics costs and improvement in overall operational efficiency.*
***Keywords:** Logistics, Inventory Management, Supply Chain, ANOVA, Operational Efficiency, National Fitting Ltd.*

I. INTRODUCTION

Logistics operations are a critical component of any manufacturing business, playing a significant role in optimizing the flow of materials, information, and finished goods. In today's highly competitive environment, efficient logistics operations are key to reducing costs, improving delivery performance, and enhancing customer satisfaction. National Fitting Ltd., a prominent player in the industrial fittings sector, faces unique challenges in managing its logistics operations. The company's operations rely heavily on an intricate network of suppliers, warehouses, and transportation systems to deliver products to customers in a timely and cost-effective manner. Efficient management of logistics processes is crucial for ensuring that National Fitting Ltd. maintains its competitive edge while meeting increasing customer demands.

This study aims to evaluate the logistics operations within National Fitting Ltd. by examining key areas such as inventory management, transportation, and the coordination of supply chain activities. The company's operational framework is complex, involving multiple stakeholders and a diverse range of products, which can impact the efficiency of its logistics system. Understanding the performance and potential bottlenecks in the logistics chain will provide valuable insights into areas for improvement. By conducting a detailed analysis of logistics practices, this research seeks to identify critical factors influencing operational costs and performance.

The research utilizes descriptive statistics and one-way ANOVA to analyse the efficiency of logistics operations at National Fitting Ltd. Descriptive statistics will offer a comprehensive overview of current logistics processes, while the ANOVA test will help assess the significance of differences across various logistics dimensions. By combining these methods, the study aims to provide actionable recommendations to streamline operations and enhance the company's logistical performance, ultimately leading to improved service delivery and cost savings.

II. STATEMENT OF THE PROBLEM

The logistics operations at National Fitting Ltd. face significant challenges in optimizing efficiency, reducing operational costs, and enhancing service delivery. Despite the company's efforts to streamline transportation, inventory management, and warehousing processes, there is a noticeable gap in the integration of advanced technologies and lean practices that could further improve overall performance. The problem lies in identifying the key inefficiencies within these logistics functions and understanding how the adoptionof digital tools, process optimization, and better resource management can reduce costs, improve coordination, and ultimately enhance the company's competitiveness in a rapidly evolving market. This study aims to address these issues by analyzing the current logistics operations and proposing actionable solutions to improve their effectiveness and efficiency.

III. SCOPE OF THE STUDY

The scope of this study encompasses a comprehensive analysis of logistics operations within National Fitting Ltd., focusing on key processes such as inventory management, transportation, supply chain coordination, and overall operational efficiency.

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The study aims to evaluate the current logistics strategies employed by the company and identify areas of improvement that could lead to enhanced cost-effectiveness and performance. It will also examine the impact of various logistics variables on the company's operational outcomes, utilizing descriptive statistics and one-way ANOVA for data analysis. While the study primarily concentrates on internal logistics operations, it also considers the broader implications of supply chain and transportation systems. The findings will provide actionable insights that can help National Fitting Ltd. optimize its logistics operations to meet the growing demands of its industry while maintaining a competitive edge.

IV. REVIEW OF LITERATURE

Kučera (2017)analyzed the advantages and disadvantages of implementing a Warehouse Management System (WMS) in a logistics enterprise. The study focused on how WMS adoption could reduce logistics costs and enhance process efficiency. Using qualitative research, a case study of a logistics enterprise that implemented WMS was examined. The results showed that WMS significantly reduced costs related to labor, handling equipment, and material identification. Extending WMS across other logistics segments could improve integration, resource utilization, and continuous operational improvement.

Ristovska et al. (2017)examined the impact of logistics management practices on company operations, focusing on transportation, warehousing, packaging, inventory, and information management. Using data from 80 companies in Macedonia, the study showed that efficient management of these logistics functions reduced logistics costs and improved competitiveness. The research confirmed that optimizing logistics activities leads to better operational efficiency, customer satisfaction, and enhanced business performance.

Burinskienė&Daškevič (2024) explored the impact of digitalization on the logistics industry, conducting a bibliometric analysis to identify key technological trends. Their research, based on studies from the Web of Science database, showed that investments in digital technologies, especially the Internet of Things (IoT), enhanced logistics efficiency, workforce productivity, and competitiveness. The study demonstrated that embracing digital technologies strengthens organizational adaptability and improves performance in the logistics sector.

Poljančić (2025)analyzed how Warehouse Management Systems (WMS) improved warehouse digitalization in the retail sector. The study combined a literature review and a case study of a retail warehouse that implemented WMS. Results revealed that WMS improved inventory accuracy, reduced order time and delivery errors, lowered costs, and increased customer satisfaction and transparency, showcasing its significant operational and economic impacts.

Verbivska et al. (2023) highlighted the necessity for digital technologies in logistics under globalization. The study identified principles for implementing digital technologies to improve logistics efficiency. The results showed that digitalization enhanced transportation safety, optimized resource supply costs, and improved information exchange, contributing to improved logistics performance and enabling the introduction of innovative customer support tools.

Green et al. (2008) assessed the impact of logistics performance on organizational outcomes, with supply chain management strategy as an antecedent. Using structural equation modeling (SEM) and data from 142 plant and operations managers, the study found that logistics performance positively impacted marketing performance, which in turn positively influenced financial performance. However, neither logistics performance nor supply chain management strategy directly affected financial performance.

Turrisi et al. (2013) investigated the impact of reverse logistics on order and inventory variance in a supply chain. Using a mathematical modeling approach, the study found that reverse logistics increased inventory variance but that a well-designed reverse flow improved overall performance. The proposed order policy, R-APIOBPCS, effectively mitigated the impact of reverse flow on supply chain performance.

Sezhiyan et al. (2011) explored the relationship between supply effort management, logistics capabilities, and supply chain management strategies on firm performance. Through structural equation modeling (SEM) and data from supply chain professionals in India, the study found that effective logistics capabilities and supply effort management positively influenced supply chain management strategy and overall firm performance. The study provided useful metrics for measuring and improving logistics practices and efficiency.

V. OBJECTIVES OF THE STUDY

- Analyse current logistics workflow and identify bottlenecks.
- Evaluate integration of logistics with inventory and order management.
- Suggest digital and lean methods to streamline logistics.
- Assess the impact of logistics efficiency on supply chain performance.

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- Recommend strategies to reduce lead time and cost.

VI. RESEARCH METHODOLOGY

Research Type: Descriptive

Data Collection

Primary Data:Primary data were collected through structured interviews, surveys, and questionnaires administered to logistics managers, supervisors, and employees at National Fitting Ltd.

Secondary Data:Secondary data were gathered from various external and internal sources, including academic journals, industry reports, company records, government publications, market research papers, and previous studies relevant to logistics management and operational efficiency in the industrial sector.

Sampling Type: Stratified Random Sampling

Sampling Universe: The sampling universe for this research comprised employees of National Fitting Ltd. across various departments associated with logistics operations, including inventory management, transportation, supply chain coordination, and warehouse management.

Sample Size: 150

Statistical Tools Used: Percentage Analysis, One-Way ANOVA

VII. LIMITATIONS OF THE STUDY

- The study is confined to the logistics operations of National Fitting Ltd. within its current operational region, potentially limiting the generalization of findings to other locations or subsidiaries.
- The analysis relies on data provided by the company, which may be incomplete, outdated, or inconsistent across various departments, affecting the accuracy of the results.
- Due to time limitations, the study only focuses on a snapshot of the company's logistics operations rather than long-term trends or seasonal variations that may impact performance.

VIII. DATA ANALYSIS AND INTERPRETATION

PERCENTAGE ANALYSIS

Variables	Particulars	Frequency	Percent
Department	Logistics	39	26.0
	Procurement	35	23.3
	Warehouse	29	19.3
	Transport	47	31.3
Designation	CEO	18	12.0
	Manager	38	25.3
	Supervisor	35	23.3
	Workers	36	24.0
	Others	23	15.3
Years of Experience in the Current Role	Less than 1 year	40	26.7
	1–3 years	31	20.7
	3–5 years	35	23.3
	More than 5 years	44	29.3
What Logistics Model Is Currently Followed?	In-House Logistics	24	16.0
	Hybrid (In-House + 3PL)	44	29.3
	Third-Party Logistics (3PL)	20	13.3
	Not Sure	62	41.3
How Would You Rate	Very Efficient	26	17.3

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Efficiency Of Current Logistics Operations?	Efficient	21	14.0
	Neutral	48	32.0
	Inefficient	29	19.3
	Very Inefficient	26	17.3
	Total	150	100.0

Among the 150 respondents, the largest proportion of respondents work in the Transport department (31.3%), Logistics (26%), Procurement (23.3%), and Warehouse (19.3%). Respondents' designations were varied, with the majority holding positions as Managers (25.3%) or Supervisors (23.3%), CEOs (12%), Workers (24%), and Others (15.3%).The distribution of years of experience reveals that the majority of respondents have been in their current role for more than 1 year, with 29.3% having more than 5 years of experience, 26.7% having less than 1 year, 23.3% with 3-5 years, and 20.7% with 1-3 years. When asked about the logistics model currently Hybrid model (In-House + 3PL) at 29.3%, 16% use In-House logistics and 13.3% use Third-Party Logistics (3PL), 41.3%, were uncertain about the logistics model in use. In terms of efficiency, 32% rated their logistics operations as neutral, 17.3% considered them very efficient and another 17.3% found them very inefficient

Descriptive Statistics for theDigital and Lean Methods to Streamline Logistics

Particulars	N	Mean	SD
Transportation Scheduling Efficiency			
Use of GPS tracking	150	2.56	1.184
Automated inventory management	150	2.55	1.173
Real-time shipment updates	150	2.67	1.066
Valid N (list wise)	150		

The above table indicates that the respondents ineffective with the use of GPS tracking (2.56), automated inventory management (2.55) and real-time shipment updates (2.67).

Comparison between the Variables(**Department,** Designation, Years of Experience in the Current Role, What Logistics Model Is Currently Followed?,How Would You Rate Efficiency Of Current Logistics Operations?) of the Respondents and Various Dimensions

Ho1: There is a significant difference between the variables (department, designation, years of experience in the current role, what logistics model is currently followed?, how would you rate efficiency of current logistics operations?) of the respondents and various dimensions

Dimensions	Particulars	N	Mean	SD	F	Sig
Department	Logistics	39	3.07	0.762	.526	.665
	Procurement	35	3.08	0.833		
	Warehouse	29	2.91	0.739		
	Transport	47	2.90	0.906		
	Total	150	2.99	0.818		
Designation	CEO	18	2.61	0.786	3.854	.005
	Manager	38	2.75	0.729		
	Supervisor	35	2.96	0.885		
	Workers	36	3.25	0.794		
	Others	23	3.30	0.717		
	Total	150	2.99	0.818		
Years of Experience in the Current Role:	Less than 1 year	40	3.22	0.923	1.728	.164
	1–3 years	31	2.91	0.848		
	3–5 years	35	2.99	0.674		
	More than 5 years	44	2.83	0.779		
	Total	150	2.99	0.818		

What Logistics Model Is Currently Followed?	In-House Logistics	24	3.11	0.746	.277	.842
	Hybrid (In-House + 3PL)	44	2.93	0.858		
	Third-Party Logistics (3PL)	20	2.93	0.828		
	Not Sure	62	2.99	0.826		
	Total	150	2.99	0.818		
How Would You Rate Efficiency Of Current Logistics Operations?	Very Efficient	26	2.99	0.931	.581	.677
	Efficient	21	3.22	0.725		
	Neutral	48	2.98	0.823		
	Inefficient	29	2.89	0.773		
	Very Inefficient	26	2.92	0.834		
	Total	150	2.99	0.818		

There is a substantial link between departments (0.665),years of experience in the current role (0.164), what logistics model is currently followed? (0.842),how would you rate efficiency of current logistics operations?(0.677) and the variables of the respondents. There is no substantial link between designation (0.005) and the variables of the respondents.

Designation

A significant difference was found in the ratings across different designations (CEO, Manager, Supervisor, Workers, and Others), indicating that designation influences perceptions. The results suggests that individuals in higher-level positions, such as CEOs, tend to rate the dimensions lower (2.61) compared to those in lower-level roles. In contrast, Workers and Others rated the dimensions higher, with mean ratings of 3.25 and 3.30, respectively.

IX. FINDINGS

Most of the respondents are from the Transport department, Most of the respondents hold the designation of Manager. Most of the respondents have more than 5 years of experience in their current role. Most of the respondents are unsure about the logistics model currently followed. Most of the respondents rate the efficiency of the current logistics operations as neutral.

Digital and Lean Methods to Streamline Logistics

Moderate efficiency is reported in transportation scheduling, with a noticeable use of GPS tracking and automated inventory management systems. Real-time shipment updates are perceived as slightly more effective in streamlining logistics operations. However, there is a general tendency towards neutrality in the effectiveness of these digital and lean methods, suggesting room for improvement in their implementation.

X. SUGGESTIONS

- Implement more advanced inventory management systems that leverage real-time data for better stock tracking and reduced excess inventory, improving efficiency and minimizing storage costs.
- Incorporate automated scheduling tools and GPS tracking to streamline transportation routes, improving delivery times, reducing operational delays, and cutting transportation costs.
- Introduce more robust systems for real-time tracking of shipments and goods in transit to improve decision-making, reduce bottlenecks, and enhance coordination between departments.
- Adopt lean logistics practices such as Just-in-Time (JIT) inventory systems to minimize waste, optimize resource utilization, and increase operational efficiency.
- Explore the use of robotics and automation in warehousing and inventory management to reduce manual errors, improve speed, and lower labor costs.
- Conduct regular training sessions for employees on the latest logistics technologies, software tools, and lean principles to ensure they are equipped to handle evolving operational demands.
- Collaborate more closely with suppliers to improve delivery reliability and ensure that raw materials are available when needed, reducing inventory holding costs and streamlining operations.

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- Establish a culture of continuous improvement by regularly reviewing logistics operations, collecting feedback from employees, and implementing corrective actions for inefficiencies.
- Revaluate and optimize the current warehouse layout for more efficient storage and retrieval processes, reducing handling time and improving overall warehouse productivity.
- Adopt environmentally friendly logistics practices such as using electric vehicles for transportation, reducing packaging waste, and implementing green warehouse initiatives to enhance corporate social responsibility and reduce environmental impact.

XI. CONCLUSION

In conclusion, the logistics operations at National Fitting Ltd. play a pivotal role in the company's ability to meet customer demands and remain competitive in the industrial sector. The study revealed that while certain areas of logistics, such as inventory management and transportation, are performing adequately, there are several opportunities for improvement. Key aspects like real-time shipment updates, GPS tracking, and automation could significantly enhance the efficiency of logistics operations, ensuring smoother processes and reduced costs.

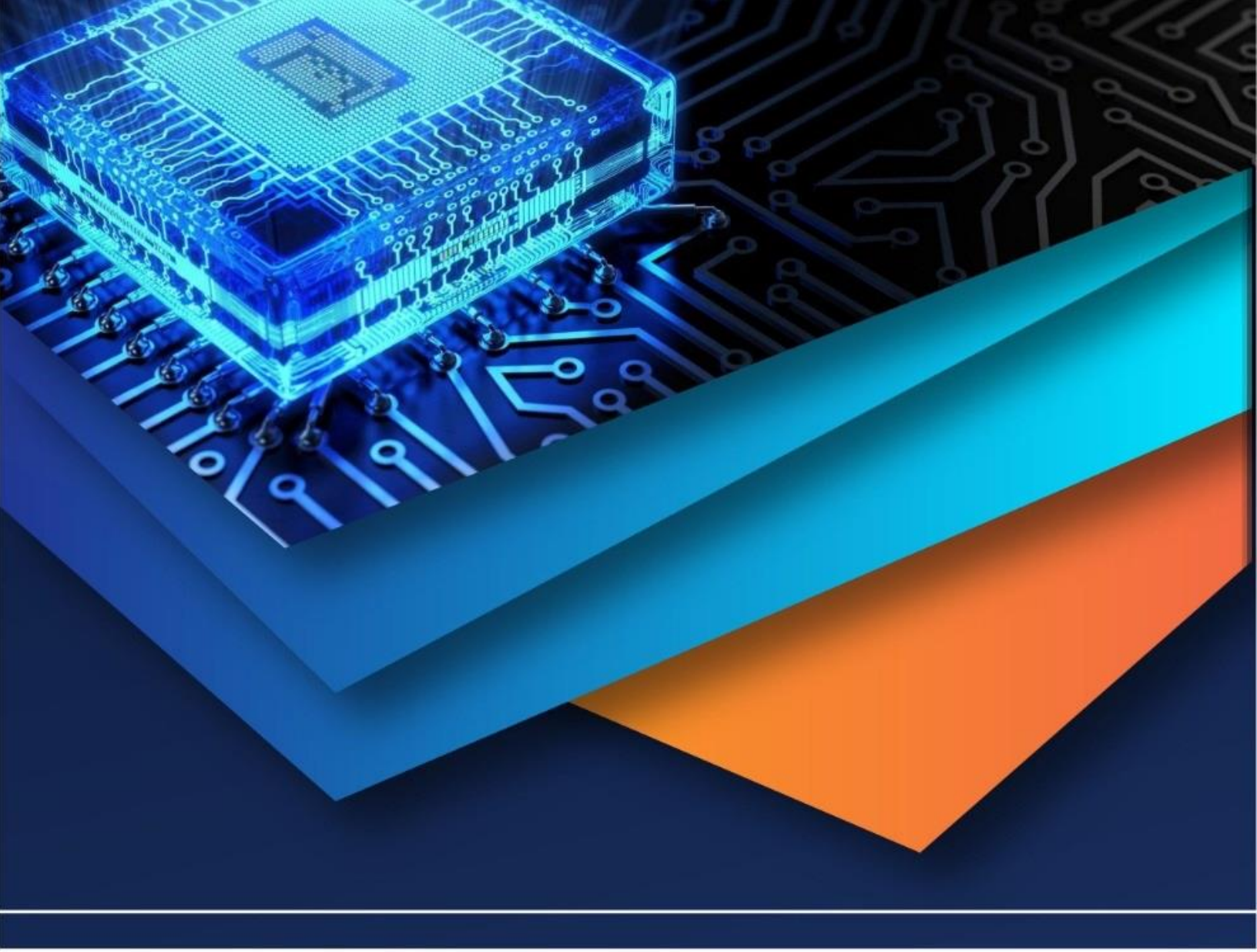
The analysis also highlighted that the integration of lean logistics practices and the adoption of advanced technologies would provide National Fitting Ltd. with a more streamlined and cost-effective logistics system. Implementing tools like automated inventory management and robotics could help the company reduce waste, minimize manual errors, and improve overall operational performance. A more strategic approach to transportation scheduling and supply chain visibility will further optimize the flow of materials and goods, enabling better decision-making.

Ultimately, National Fitting Ltd. has the potential to significantly improve its logistics operations by embracing digital transformation, enhancing employee training, and fostering a culture of continuous improvement. By focusing on process optimization and technology integration, the company can ensure more efficient logistics that will not only reduce costs but also improve service delivery, customer satisfaction, and long-term growth.

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