EXAMINING THE FACTORS INFLUENCING PERFORMANCE OF 3PL SERVICE PROVIDERS: AN EMPIRICAL ANALYSIS

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Introduction

Today, India's logistics sector is thriving and changing. A strong logistics sector is crucial to development.Infrastructure, technology, and new service providers will determine if the industry can help consumers reduce logistics costs and improve services. Logistics is a key area where companies may save costs and improve customer experience due to the global market. However, the digital revolution requires methodical management to boost production and efficiency. Company growth depends on disruptive technology infrastructure. Their supply chain must be connected and technologically driven. New services and products that damage, degrade, or replace established ones are disruptive technology. Big data and grid technologies can help 3PL providers maintain visibility in all supply chain linkages and reduce the cost of obtaining the best at the lowest price.Third-party logistics companies are essential for supply chain and reverse logistics integration. Today, 3PL, Third Party logistics service companies engage with supply chains to identify issues and execute solutions. Logistics service providers help large and small companies tackle supply chain management difficulties like cost reduction, inventory efficiency, speed to market, waste reduction, touch point reduction, and trade barrier removal. Companies guess how logistical operations affect them.Over the past few decades, various research studies have been discussed to examine logistics service providers' effectiveness.There is a gap in understanding disruptive digital technologies' impact on customer performance in Chennai City.This study will analyze third-party logistics service providers' essential characteristics and performance indicators.

Literature Review

Melkiory, G. (2020) analyzed the elements affecting the efficiency of humanitarian logistics in Tanzania. The study utilized a descriptive studystrategy using quantitative and qualitative research methodologies. The study focused on 399 respondents in total. Out of the total, 200 participants were chosen by stratified and purposive sampling methods.

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Quantitative data was gathered by distributing questionnaires to the participants and analyzed using descriptive and inferential statistics such as factor and regression analysis. Qualitative data was gathered via in-person interviews and analyzed through content analysis. Government rules and regulations significantly impact the performance of humanitarian logistics in Tanzania. The results indicate that ICT substantially impacts the efficiency of humanitarian logistics in Tanzania. The study found that government policies, legislation, and ICT significantly impacted the performance of humanitarian logistics in Tanzania. The study also suggests that the Government of Tanzania (GoT) should revise its policies and regulations regarding humanitarian issues to meet the needs of humanitarian partners. Delegate more powers to regional or district committees, implement a web-based system in NRC, and utilize an integrated IT system for supplier relationship management.

Getambu, S (2021) examined logistics enterprises' ICT adoption and the factors influencing it in Nairobi, Kenya. The study examined how government considerations, resource capability, managerial capability, and organization structure affect ICT adoption. Descriptive research was used in this positivist study. According to the Yamane formula, 260 logistics enterprises with one senior-level manager were studied. The final sample was 240 respondents, with 20 considered for the research instrument pre-test. The study used structured questionnaires to acquire primary data. The research objectives were met by graphically presenting the results. Positive and significant correlations were found between government variables, resource capabilities, managerial capability, and organization structure and ICT adoption. The regression showed that government variables, resource capability, managerial capability, and organization structure affect 62.2% of ICT adoption. According to the research, government considerations, resource capability, managerial capability, and organization structure positively and significantly affect ICT adoption.The study advised enterprises' management teams to strengthen financial resource mobilization, recruitment of qualified people, investment in modern technical infrastructures, and staff delegation of duty. The research also suggested that the government improve the business environment and give incentives through laws to boost transport and logistic enterprises' competitiveness and ICT use.

Huang J (2022) investigated knowledge-based elements affecting logistics companies' technological innovation. Beijing, Shanghai, and Guangzhou are the dissertation's key research locations for China's 50 SME logistics businesses' questionnaires. First, the theoretical foundations of technological innovation, enterprise dynamic capability, and knowledge were compiled; the relevant literature was sorted at home and abroad; and 14 research hypotheses were proposed for studying knowledge-based factors influencing

logistics technological innovation. We then built a conceptual model to examine how internal and external factors affect organizations' technological innovation capabilities through knowledge innovation and management. Additionally, logistics sector characteristics were combined with domestic and international scales to construct variable measurement items.Internal learning ability, organizational structure, technical talents, and firm size of logistics enterprises will positively influence logistics technology innovation through knowledge innovation and management. External information facilities positively affect logistics technology innovation through knowledge management, and the policy environment positively influences knowledge innovation. Information infrastructure and policy environment have relatively small positive effects on knowledge innovation and management. Based on the investigation results, this research paper proposes countermeasures to improve logistics firms' technical innovation capability and promote sustainable and healthy growth.

Vithayaporn, S, Nitivattananon, V, Sasaki, N, & Santoso, DS (2023) determined the factors influencing green logistics performance in urban tourism along Thailand's Eastern Economic Corridor (EEC). Semi-structured interviews with 25 leading logistics companies revealed five significant factors: green transportation system implementation, environmental management system level, reverse logistics improvement, government governance level, and perceived usefulness of green logistics for logistics enterprises. The study discovered that both the government and businesses play an essential role in launching green logistics, and this activity is the mechanism driving the identified elements. This study has important scientific significance since it provides a holistic view of the benefits of green logistics to urban tourism. It can also assist in influencing decisions about improving green logistics performance for the long-term development of regions.

3. Research Gap

Logistics supports organizations as they strive for a more efficient management system. In business practices, an efficient logistic system and inefficient internal management would disable the organization from responding to customer needs with the lowest price at the shortest possible time frame, including quality, putting the organization at a competitive disadvantage. Previous studies emphasized the developed world. The findings of 3PL firms could not reflect the universe of enterprises or be applied to other nations because each country's cultural, social, economic, and environmental factors affected logistics management and performance. To generalize the causal relationship between logistics management and logistic business performance, multiple regression contexts were needed for empirical confirmation. This study, therefore, intended to empirically examine how transport management, packaging management, warehouse management, ordered process

management, and disruptive technology management influenced 3PL Service providers' performance.

4. Objective of the Study

- To study the client's profile and rank the facility of 3PL Service Providers.
- To evaluate the significant difference among the mean rank of nature of the firm regarding the logistics integration system of 3PL Service Providers
- To identify the most criticallogistics integration system elements and their impact on the firm performance at 3PL Service Providers

5. Research Methodology

By utilizing a descriptive research design, this study examines the interrelationships between the various factors that impact the performance of 3PL service providers. Additionally, a total of 126 client surveys were gathered via quota sampling using structured questionnaires. Freidman analysis, Kruskal-Walli's analysis, and multiple regression analysis were employed to test the hypotheses.The construct of the research instrument was evaluated utilizing a five-point Likert scale that varied from 1 (strongly disagree) to 5 (strongly concur). Thirteen clients participated in an initial survey to determine the instrument's dependability.The results of Cronbach's Alpha revealed that(Warehouse Efficiency =0.830), (Transport Efficiency =0.722), (Order Fulfilment Efficiency =0.707), (Packaging Efficiency=0.885), (Disruptive Technology Efficiency= 0.903) and (Logistics Integration System=0.950)

6. Data Analysis and Results

Table 1.ClientProfile of 3PL Service Providers

ClientsSurvey (n = 126)		
Attributes	Classification	Percentage
Size of the firm	Small (97)	30.2
	Medium (33)	31.0
	Large (49)	38.9
Sector	Automotive(48)	38.1
	Healthcare(30)	23.8
	Telecom(28)	22.2
	Beverage(20)	15.9
Operation of the firm	Less than 5 years(30)	23.8
	6 to 10 years(59)	46.8
	11 to 15 years(37)	29.4

Table 1 shows that out of all the clients, 38.9% are from significant firms, 31% are from medium firms, and 30.2% are from small firms. Also, out of all the clients, 38.10

percent are from the automotive industry, 23.8 percent are from the healthcare industry, 22.2 percent are from the telecom industry, and 15.90 percent are from the beverage industry. Furthermore, it was observed that almost 46.8% of firms have been operating for 6 to 10 years, 29.40 for 11 to 15 years, and 23.80 for less than five years.

Friedman Test

Ho:There is no significant difference between mean rank and the facilities of 3PL service providers.

Table 2. Mean ranks of 3PL Facilities, along with the Friedman test result

3PL Facilities	Mean Rank	Chi-Square Value	P Value
Consultancy and Professional Services	(3.55)	(55.702)	(0.000)
Product Management Solutions	(4.00)		
Manufacturing Support	(4.75)		
Warehousing and Distribution	(4.30)		
Warehousing and Distribution	(4.60)		
Integrated Packaging Solutions	(4.79)		
Information Systems	(4.85)		
Sourcing and Procurement	(5.15)		

The Friedman test showed that the observed values (Prob = 0.000) are less than 0.05, indicating a very high significant difference among the facilities of 3PL Service Providers at a five percent level, as shown in Table 2. Therefore, the alternative hypothesis is rejected. Based on the mean rank score, sourcing and procurement (5.15) were identified as the most crucial facilities provided by 3PL Service Providers.

Multiple Regression Analysis

Table 3 shows the most critical factors that impact the success of 3PL service providers, including warehouse efficiency, transport efficiency, order fulfillment efficiency, packaging efficiency, disruptive technology efficiency, and logistics integration system.

Table 3. 3PL Service Provider MRA Summary

MRA Summary	
Dependent Variable	3PL Logistics Performance (Y)
Independent Variables	1. Warehouse Efficiency (X1) 2. Transport Efficiency (X2) 3. Order Fulfilment Efficiency (X3) 4. Packaging Efficiency (X4) 5.Disruptive Technology Efficiency (X5) 6. Logistics Integration System (X6)
Multiple R-value	(0.836)
R Square value	(0.698)
P value	(0.000)

Table 4. Variables Result in Multiple Regression Analysis

Variables	Unstandardized co-efficient		Standardized co-efficient (Beta)	t value	P value
	(B)	SE of B			
Constant	(.381)	(.703)	-	(.542)	(.589)
X_1	(.270)	(.104)	(.267)	(2.596)	(.011)
X_2	(.087)	(.112)	(.086)	(.774)	(.441)
X_3	(.153)	(.114)	(.144)	(1.342)	(.182)
X_4	(.052)	(.111)	(.045)	(.465)	(.643)
X_5	(.280)	(.107)	(.258)	(2.611)	(.010)
X6	(.129)	(.102)	(.126)	(1.268)	(.207)

The result of MRA revealed that the coefficient of X5 is 0.280, representing the partial effect of disruptive technology efficiency on logistics performance, holding the other variables constant as shown in Table 4. The estimated positive sign implies that such an impact is positive that logistics performance would increase by 0.280 for every unit increase in Disruptive Technology Efficiency,and this coefficient value is significant at 1% level. Besides, the coefficient of X1 is .270, representing the partial effect of Warehouse Efficiency on logistics performance, holding the other variables as constant. The estimated positive sign implies that such an impact is positive, that logistics performance would increase by .270 for every unit increase in warehouse efficiency, and that this coefficient value is significant at the 1% level.Moreover, the coefficient of X3 is .153, which represents the partial effect of Order fulfilment efficiency on logistics performance, holding the other variables constant. The estimated positive sign implies that such impact is positive that logistics performance would increase by .153 for every unit increase in Order fulfilment efficiency, and this coefficient value is significant at 1% level.

$$Y = 0.381 + 0.270X_1 + 0.087X_2 + 0.153X_3 + 0.052X_4 + 0.280X_5 + 0.129X_6$$

Discussion and Conculstions

Third-party service providers need to use an automated transport management solution. Automating route planning can optimize driving routes, and guarantee drivers are distributed as efficiently as possible.In addition, warehouse efficiency positively influences logistics performance. Hence, 3PL service providers must employ innovative warehouse techniques. A warehouse management system or an ERP system with a robust WMS module can boost efficiency by recommending the optimal routes and methods for picking or putting away. It is suggested that New avenues of packing and shipping can be introduced for new products to protect them from damage and excessive weight changes. It is also

recommended that RFID-enabled devices beused in operation to store excessive data. Further, disruptive technology-enabled information flows can enhance sales volume by addressing customers directly and quickly whenever a new product is offered. Disruptive technology empowers a business to respond to customer inquiries, follow customers' orders, and provide superior customer service. This leads to greater consumer happiness and improved marketing performance.Finally, the result of multiple regression revealed that disruptive technology is the most dominating factor influencing the logistics performance of third-party service providers. Digital disruption technological aspects and their effects on third-party service providers' performance have been the primary focus of this study. A network model of reverse logistics could be developed by more studies investigating affecting elements. In addition, 3PL Service Providers' green logistics policies and operational effectiveness can be measured by comparable studies.

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