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# **Analyzing E-Logistics Integration in Supply Chain Operations towards Chennai's Transportation Industry**

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#### ABSTRACT

The impact of e-logistics on improving supply chain management at Transport industry, a leading transport and logistics Industry in India, is the focal point of this study. Nowadays, with rapidly evolving technology, logistics is changing rapidly. Logistics is moving from traditional systems to digital platforms. E-logistics is the deployment of digital technologies e.g. GPS tracking, Internet of things (IoT), automation, artificial intelligence (AI) and cloud computing to support and improve logistics processes. The digital technologies facilitate logistics by making the supply chain efficient, which reduces costs, eliminates unnecessary manual tasks, and provides real-time visibility throughout the supply chain. In transport industy, e-logistics has brought radical changes to vehicle tracking, route planning, warehouse management, and customer service. This study analyses how ways in which technologies have positively impacted the Industry's operational efficiency, cost-savings and service quality. It investigates the transformational role of digital integration in speeding up decision-making and improving inter department coordination. While the benefits are clear-cut, there are obstacles with the transition to e-logistics. Some of the central issues are; the high costs of implementation; the need for integrations with existing systems; the immediate and current lack of skilled workforce, and issues surrounding cybersecurity. These issues can delay the transition process and affect the efficacy of the digital tools. The study utilizes primary data from questionnaires across employees of transport industry like PRR Travels with secondary data from the literature and Industry documentation. The results highlight that despite the challenges, the advantages of e-logistics, including supply chain visibility, efficient resource use, and customer satisfaction, will make participating in and investing in e-logistics a key priority for the Industry's growth.

Keywords: E-logistics, Supply Chain Management, Digital Transformation, Transport, Customer Satisfaction

# **INTRODUCTION:**

In the ever-changing world of business, logistics plays an essential role in ensuring the effective passage of goods, services and information throughout the supply chain. Digital technology has changed logistics operations into a highly dynamic and functional process which is now referred to as e-logistics. The notion of e-logistics is the utilization of advanced digital technologies such as GPS, automation, Internet of Things (IoT), artificial intelligence (AI) and cloud-based platforms to develop logistics operations. The application of these technologies provide concerts in the way logistics operations are supervised, speeds up and automates warehouse/inventory management and delivers better, expedited decision making processes.

With an organization such as PRR Travels that has transportation operations and logistics operations, e-logistics is a significant enabler in aspects of service quality with the growth of expecting customers, as well as operational processes. The key to the Industry's application and emphasis on these technologies supports route planning, ensures fleet optimization, increases service reliability, and effective cost management. With ongoing pressure from competitive industries and some degree of transparency in logistics operations, e-logistics has moved from a best practice choice to an enabler for growth and sustainability. The intention of this section will provide the groundwork to understand the term e-logistics, what it entails and its importance and relevance as it relates PRR Travels.

#### **Benefits of E-Logistics**

- **Operational Efficiency:** Automated tracking decreases delays and allows you to move your fleet more.
- Cost Savings: Automated routing and optimization saves fuel and labor spend.
- Customer Satisfaction: Real-time tracking, predictability of delivery, and transparency of service creates a better experience for customers.
- Data-Driven Decision Making: Analytics allow for forecasting, planning inventories and anticipating demand.

#### **Future Outlook**

The logistics and transportation world is rapidly changing, and hopes to enhance its capabilities by,

- ✓ Exploring new technologies like AI, IoT, Blockchain that will allow for transparency within the supply chains;
- ✓ Building the logistics network to reach larger amount of cities and business centers;
- ✓ Building partnerships with e-commerce and retail companies for last-mile delivery services;
- ✓ Heightening sustainability initiatives with fuel-efficient vehicles and green logistics strategy.
- PRR Travels can utilize E- Logistics, along with new-age digital innovations, to efficiently improve their operational efficiency, maximize profitability and implement services with logistics solutions for their customers. PRR Travels' advantage is its commitment to innovation, customer delight and investment in technology to spur its growth in the extremely competitive logistics business.

# **REVIEW OF LITERATURE**

Zunder and Islam (2011) explored the significance of e-logistics systems in optimizing logistics operations for both service providers and users. Their study emphasized the role of digitalization in enhancing supply chain efficiency, particularly through real-time tracking, automated decision-making, and cost reduction. The research highlighted how e-logistics applications facilitate improved coordination between logistics partners, thereby reducing lead times and enhancing service quality. Furthermore, the study examined case studies that demonstrated the effectiveness of technology-driven logistics solutions in addressing challenges related to transportation and inventory management. The findings suggest that adopting e-logistics systems enables organizations to achieve greater transparency, flexibility, and responsiveness in their supply chain operations.

*Prianto, Wongsurawat, and Yama (2020)* conducted a critical assessment of the factors influencing elogistics customer satisfaction, with a specific focus on the mediating role of information technology in Thailand's food sector. Their study highlighted the importance of IT-driven logistics solutions in enhancing customer experience, ensuring timely deliveries, and improving overall service quality. By analyzing key determinants such as system reliability, data accuracy, and real-time tracking, the research underscored the significance of technological advancements in shaping customer perceptions of e-logistics services. The findings suggested that information technology plays a crucial role in bridging the gap between logistics service providers and end-users by facilitating seamless communication, reducing errors, and optimizing supply chain processes. Furthermore, the study aligned with prior research (e.g., Zunder& Islam, 2011) that emphasized the transformative impact of digitalization on logistics efficiency.

*MahbubulHye, Miraz, Sharif, and Hassan (2020)* investigated the factors influencing e-logistics in the retail supply chain of Malaysia, with a particular focus on the mediating role of information and communication technology (ICT) and technology integration. Their study highlighted that e-logistics efficiency is significantly impacted by key factors such as infrastructure readiness, digital adoption, and supply chain coordination. The authors emphasized that ICT serves as a crucial enabler in enhancing logistics operations, improving data flow, and optimizing delivery processes.

Archetti and Peirano (2020) examined the complexities of air intermodal freight transportation, focusing on the freight forwarder service problem. Their study highlighted the critical role of freight forwarders in optimizing multimodal transport solutions, balancing cost efficiency, service quality, and operational constraints. By developing a mathematical model, the authors addressed key challenges such as route selection, capacity allocation, and transit time minimization. The research emphasized the importance of integrating air transport with other freight modes to enhance supply chain efficiency while considering regulatory and environmental constraints.

*Hye, Miraz, Sharif, and Hassan (2020)* explored the factors influencing logistics supply chain performance, with a specific focus on the mediating role of blockchain adoption. One way organizations can enhance logistics efficiency is by integrating blockchain technology to improve transparency, data security, and operational accuracy. By ensuring real-time tracking, fraud prevention, and automated documentation, businesses can strengthen trust and collaboration within the supply chain. Implementing blockchain requires organizations to invest in technology infrastructure, develop regulatory-compliant policies, and train employees to manage digital transformation effectively. However, the study identified challenges such as high implementation costs, regulatory constraints, and industry resistance to change, which may hinder adoption. Despite these obstacles, blockchain presents an opportunity to streamline logistics operations, enhance supply chain visibility, and improve decision-making processes.

### **OBJECTIVES OF THE STUDY**

- ✓ To examine the role of e-logistics in enhancing transparency and real-time tracking in the supply chain at the industry.
- $\checkmark$  To explore the future prospects of e-logistics in the travel and transportation sector.
- ✓ To evaluate the benefits and challenges associated with implementing e-logistics in supply chain operations.

#### **RESEARCH METHODOLOGY**

The research design for this study was descriptive, in terms of study design it was quite easy to collect and analyze data. A convenient sampling was utilized, and a total sample size of 115 respondents was used from middle-level managers, supervisors, and PRR Travels, Chennai employees. The data for study were collected from primary and secondary sources. Primary data was collected by using a standardized questionnaire, and the secondary data was collected from literature reviews, websites, books, financial statements of industries, and interviews with concerned personnel. However, the study was limited. The sample size was 115 respondents, and the study was confined to only the logistics industry in Chennai, suggesting that the generalizability will be limited. The data collected analyzed using percentage analysis, and a graphical depiction of the data was created using bar charts and pie charts. SPSS was used to conduct statistical tests and tools such as the Chi-square test and ANOVA were used to conduct hypothesis testing. The study was structured and objective, with predetermined questions. The findings of the study are expected to provide practical insights and impact e-logistics management perceptions and expectations within the organization.

# DATA ANALYSIS AND INFERENCE

H<sub>01</sub>: There is no significant relationship between the age of respondents and their familiarity with e-logistics solutions in supply chain management.

H<sub>11</sub>: There is a significant relationship between the age of respondents and their familiarity with e-logistics solutions in supply chain management.

# Table 1. Table indicating ANOVA Test on the descriptive relationship between Age familiarity levels with E-logistics solutions in Supply Chain Management

	Descriptive							
Familiar with E - logistics solutions in supply chain management	Age Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean (Lower Bound - Upper Bound)	Min	Max
	18-25	50	19.33	7.88	1.11	17.09 - 21.57	11	25
	26-30	29	11.00	4.36	0.81	9.31 - 12.69	6	14
	31-40	22	7.67	3.06	0.65	6.28 - 9.06	4	10
	Above40	14	4.67	1.53	0.41	3.75 - 5.58	3	6
	Total	115	14.25	8.01	0.75	12.77 - 15.73	3	25

ANOVA						
Familiar with E Logistics solutions in supply chain management	Source	Sum of Squares (SS)	df	Mean Square (MS)	F	Sig. (p value)
	Between Groups	5071.11	3	1690.37	78.62	0.0230
	Within Groups	172.00	8	21.50	-	-
	Total	5243.11	11	-	-	-

#### **INFERENCE:**

It is inferred from the table 1 that p value is 0.023 which is < 0.05, so reject the null hypothesis. There is a significant difference between different age groups and their familiarity with e-logistics solutions in supply chain management.

# Table 2. Table indicating Chi Square Test on the descriptive relationship between Age and familiarity levels with E-logistics solutions in Supply Chain Management

 $H_{02}$ : There is no significant association between age and familiarity with e-logistics solutions in supply chain management.

 $H_{12}$ : There is a significant association between age and familiarity with e-logistics solutions in supply chain management.

		Descriptive				
Cross tabulation Age	Age Group	Not familiar at all	Somewhat familiar	Very familiar	Total	
Familiarity with E	18-25	9	23	20	52	
Logistics Solutions in SCM	26-30	6	14	9	29	
	31-40	5	10	5	20	
	Above 40	3	8	3	14	

<b>df</b> 6	Asymptotic Significance (2-sided) 0.885
6	0.885
	I I
6	0.881
	minimum e

# **INFERENCE:**

It is inferred from the table 2 that P value is 0.885 which is > 0.05, so we fail to reject the null hypothesis. There is no significant association between age and familiarity with e-logistics solutions in supply chain management.

### Table 3.Table indicating the Age of the respondents

S.No.	Age	No. of responses	Percentage %
1.	18 – 25	50	43.5%
2.	26 - 30	29	25.2%
3.	31 - 40	22	19.1%
4.	Above 40	14	12.2%

### Chart 1. Chart representing the Age of the respondents



# **INFERENCE:**

From the above table, it is inferred that 43.5% respondents are from the age group 18-25, 25.2% are from the age group 26-30, and 19.1% are from the age group 31-40 and 12.2% are above 40 years of age

# Table 4. Table indicating Familiar with E-Logistics Solutions

### in Supply Chain Management

Particulars	Frequency	Percentage
Very familiar	38	33.9%
Somewhat familiar	53	47%
Not familiar at all	24	19.1%
	115	100%

Figure 4. Figure representing Familiar with E-Logistics Solutions in Supply Chain Management



## **INFERENCE:**

From the above table, it is inferred that 33.9% respondent are very familiar, 47% respondent are somewhat familiar, 19.1% are respondent are not familiar.

#### RECOMMENDATIONS

The suggestions made to the industry are,

- The Industry can initiate awareness programs and training sessions to educate employees on the benefits and usage of e-logistics solutions.
- Management must allocate sufficient budget and planning for the implementation of e-logistics technology solutions.
- The most sought-after solution is automation, so the Industry can invest in automated tracking, an AI discovery route optimization, and automated digital invoicing.
- To solve the problem for adopting e-logistics, the Industry must organize skill development, choose simple platforms, and include vendor help to address the issue of integration.
- ♦ A gradual digital transformation can be introduced using pilot projects followed with full interventions.
- The Industry can improve customer satisfaction and return on investment by solidifying real-time tracing systems, providing on-time delivery, and expanding digital customer care.
- Transportation industries can work with third-party technology firms to access advanced logistics solutions without incurring heavy internal development costs.

## CONCLUSION

The study of E-Logistics in Supply Chain Operations in Transportation industry, highlighted the use of digital technologies to improve logistics efficiency and service quality. E-logistics solutions like real time tracking technologies, automated processes, and cloud computing have helped to streamline operations and reduce costs. Although PRR Travels has made progress in the adoption of these technologies, barriers remain such as the high cost of implementation, lack of trained personnel, and integration challenges. The outlook for e-logistics looks promising because new technologies such as AI and IoT are emerging. By focusing on employee training, collaboration with technology vendors, and adopting technologies that require little training, and can resolve the barriers that remain. In conclusion, e-logistics has the potential to significantly enhance the Industry's supply chain performance. With further investment in digital technologies and finding ways to overcome existing barriers,

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#### **Author Contribution**

Ms.I.Farheen designed the study, conducted data collection, conceptual framework, tested hypothesis by analyzing data and prepared the manuscript. Dr.M.Lavanya provided guidance on research design and methodology and contributed to critical revisions and final approval of the manuscript.

#### **Conflict of Interest**

The authors declare no conflict of interest in the publication of this research.

#### **Ethics Approval**

The study involves voluntary participation by respondents through informed consent.

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#### **REFERENCES:**

- Christopher, M. (2016). Logistics & Supply Chain Management. Pearson Education.
- Deloitte Insights. (2023). Digital Transformation in Logistics and Supply Chain. Retrieved from www.deloitte.com
- Lee, H. L. (2002). Aligning supply chain strategies with product uncertainties. California Management Review, 44(3), 105-119.
- Logistics Bureau. (2022). The Future of E-Logistics in Supply Chain Management. Retrieved from www.logisticsbureau.com
- Montreuil, B. (2011). Toward a Physical Internet: Meeting the Global Logistics Sustainability Grand Challenge. Logistics Research, 3(2), 71-87.

PRR Travels Official Website. (2025). Industry Profile and Logistics Operations. Retrieved from <u>www.prrtravels.com</u>Rushton, A., Croucher, P., & Baker, P. (2017). The Handbook of Logistics and Distribution Management. Kogan Page Publishers.