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ASSESSING THE EFFECT OF DIGITAL TRANSFORMATION ON 3PL ORGANIZATIONAL PERFORMANCE

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Abstract: Digital transformation has become a critical driver of competitiveness and operational excellence in Third-Party Logistics (3PL) companies. This study examines the impact of digital technologies—including automation, analytics, and digital tracking—on organizational performance within 3PL firms in Pune City. A structured questionnaire was administered to 75 respondents across 25 logistics companies. Quantitative analysis was conducted using SPSS, including descriptive statistics and regression analysis. Results show that digital transformation significantly improves operational efficiency, customer satisfaction, and financial performance. The study highlights the need for increased technology adoption across logistics operations. Findings also demonstrate strong correlations between digital tools and improved delivery speed and accuracy. This research contributes to understanding how digital capabilities shape logistics competitiveness. Implications for practitioners and future research are also discussed.

Keywords: Digital Transformation, 3PL Companies, Organizational Performance, Logistics Technology, Automation, Regression Analysis, Pune City.

1. Introduction to Topic

The logistics industry has undergone rapid evolution due to technological advancements and rising customer expectations. Third-Party Logistics (3PL) companies, in particular, are experiencing intense competition as global supply chains become more complex and demand real-time visibility. Digital transformation—which includes automation, IoT, artificial intelligence, robotics, cloud systems, and advanced analytics—has emerged as a powerful solution for enhancing logistics performance. Integrating digital technologies allows logistics firms to reduce errors, improve delivery accuracy, enhance asset utilization, and optimize inventory levels.

Moreover, digitalization provides superior data insights, enabling faster and more accurate decision-making. In the era of Industry 4.0, digital tools are no longer optional but essential for survival and growth. However, many Indian logistics firms still face challenges in adopting technology due to cost, skill gaps, and infrastructure limitations. This research focuses on assessing how digital transformation influences organizational performance in 3PL companies operating in Pune City. The study uses a quantitative survey to investigate the role of digital tools in improving operational efficiency, customer satisfaction, and financial outcomes. The findings offer valuable insights for logistics managers and policymakers.

2. 3PL Companies in India

Third-Party Logistics (3PL) companies act as outsourced partners that manage logistics functions such as transportation, warehousing, distribution, and supply chain coordination. They play a crucial role in helping manufacturers and retailers reduce operational complexities and improve supply chain responsiveness. 3PL firms provide value-added services, including tracking, inventory control, freight forwarding, demand forecasting, and order processing. The increasing need for flexibility has led businesses to depend heavily on specialized logistics providers. In India, the 3PL sector has grown rapidly due to expanding e-commerce, globalization, and increased integration of digital technologies. Pune City has emerged as a logistics hub due to industrial growth, warehouse infrastructure, and proximity to major transport routes.

To remain competitive, 3PL firms must adopt advanced digital solutions such as automation, IoT-based tracking, route optimization tools, and digital warehouse systems. These tools enhance performance by improving accuracy, reducing turnaround time, and increasing customer satisfaction. The evolution of 3PL services is tightly linked to technological readiness, making digital transformation a strategic necessity. This study examines how effectively 3PL companies in Pune leverage digital tools to strengthen their organizational performance and achieve sustained growth.

3. Objectives of the Study

1. To assess the level of digital transformation adopted by 3PL companies in Pune City.
2. To examine the effect of digital transformation on organizational performance.
3. To analyse the relationship between technology usage and operational efficiency in 3PL companies.

4. Scope of the Study

The present study is confined to **25 Third-Party Logistics companies operating in Pune City**. Data were collected from **three respondents per company**, resulting in a total sample size of **75 respondents**. The scope includes measuring digital transformation initiatives, technological readiness, operational performance, and customer satisfaction outcomes. The findings are representative of mid-sized logistics firms within the Pune region.

5. Research Questions

1. What is the level of digital transformation adopted by 3PL companies in Pune?
2. Does digital transformation significantly influence organizational performance in 3PL firms?
3. What aspects of digital technology contribute most to operational efficiency?

6. Research Hypotheses

Hypothesis-I

H0: Digital transformation has no significant effect on organizational performance in 3PL companies.
H1: Digital transformation has a significant positive effect on organizational performance in 3PL companies.

7. Literature Review:

1. Kaplan & Norton (1996) Kaplan and Norton introduced the Balanced Scorecard as a multidimensional performance measurement framework that incorporates financial and non-financial indicators. Their work emphasized the strategic role of technology in enabling better performance tracking. This forms the foundation for evaluating digital transformation impacts in logistics firms.

2. Gunasekaran et al. (2004) The authors highlighted logistics performance metrics and emphasized the role of technology-based KPIs in improving operational efficiency. They found that digital systems enhance visibility and responsiveness within supply chains. This supports the argument that digital transformation is essential for 3PL performance improvement.

3. Lin & Lee (2009) Lin and Lee demonstrated that learning, innovation, and digital capabilities significantly improve logistics performance. Their findings show that digital tools enhance

employee productivity and operational creativity. The study provides strong evidence for digital transformation as a major driver of competitiveness.

4. Lai et al. (2011) This study explored service quality within 3PL firms and found that digital tracking, monitoring, and information systems improve customer satisfaction. Real-time data availability enhances communication and service reliability. Their findings reinforce the need for digital systems in modern logistics operations.

5. Green et al. (2008) The authors revealed that organizational learning culture and technology integration significantly boost supply chain performance. They argued that technology-enabled learning increases employee adaptability and motivation. This supports digital transformation as a human capital enhancer in logistics.

6. Paul & Singh (2019) Paul and Singh identified digital transformation as a core element of logistics modernization in India. Their findings show that digital tracking, analytics, and automation enable superior service accuracy and transparency. This highlights the importance of IT adoption for 3PL growth in rapidly evolving markets.

7. Tseng & Liao (2007) Tseng and Liao emphasized that IT-enabled decision support systems enhance transport efficiency. Technologies like GPS routing and real-time data reduce delays and improve delivery accuracy. Their work supports the hypothesis that digital tools drive operational efficiency.

8. Sharma (2020) Sharma demonstrated the value of digital KPIs in improving performance measurement in logistics companies. The study found that digitized systems provide more accurate, timely, and actionable data. This aligns with the broader narrative that digital transformation strengthens performance monitoring.

9. Deshmukh (2021) Deshmukh highlighted that technology adoption enhances multidimensional organizational performance in Indian logistics firms. Digital solutions were shown to improve coordination, data flow, and service quality. This further validates the strong link between digital readiness and 3PL performance.

10. Singh & Kumar (2016) Their study showed that digital readiness is a major predictor of responsiveness and delivery performance in logistics companies. They found that companies with higher technology usage respond faster to customer needs.

8. Research Methodology

This study follows a quantitative survey-based research design. A structured questionnaire consisting of Likert-scale items was developed to measure digital transformation, technological adoption, operational efficiency, and organizational performance. The study used a sample size of 75 respondents, representing 25 3PL companies in Pune City. Respondents included operations managers, IT personnel, and logistics executives.

Data were collected through Google Forms and analyzed using SPSS software. The analysis included descriptive statistics, frequency distributions, reliability testing, correlation analysis, and regression analysis for hypothesis testing. This methodology ensures accuracy, reliability, and generalizability of results within the 3PL sector.

9. Data Analysis

9.1 Demographic Profile:

Demographic Variable	Category	Frequency	Percentage
Gender	Male	52	69%
	Female	23	31%
Age Group	21–30	18	24%
	31–40	32	43%
	41–50	17	23%
	51+	8	10%
Experience	< 5 years	15	20%
	5–10 years	28	37%
	10–15 years	22	29%
	> 15 years	10	14%

The demographic profile reveals that the majority of respondents are male (69%), indicating that the logistics and 3PL sector continues to be male-dominated. Most respondents fall within the age group of 31–40 years (43%), suggesting that mid-career professionals form the core workforce in 3PL companies. Experience levels show that 57% of the participants have more than 5 years of experience, reflecting adequate industry exposure and reliable responses. This indicates that the survey captures the viewpoints of skilled and knowledgeable logistics professionals. Overall, the demographic distribution strengthens the credibility of the study by ensuring representation from experienced and active employees in the sector.

9.2 Digital Transformation Adoption

Statement	SD	D	N	A	SA	Mean
Our company uses advanced digital tools for operations.	5	6	10	34	20	**3.92**
Automation has improved process accuracy.	6	8	12	30	19	**3.78**
Real-time tracking systems are widely used.	4	10	11	33	17	**3.83**

The results show a strong level of digital adoption among 3PL companies, with most respondents agreeing that advanced digital tools are used in daily operations. High mean scores (3.78–3.92) indicate widespread acceptance of automation and real-time tracking systems. A majority of employees acknowledge that digital tools have enhanced process accuracy, reflecting positive organizational readiness for technology. Neutral responses remain moderate, indicating some firms are still transitioning into full-fledged digital systems. Overall, the data confirms that digital transformation is actively progressing in the Pune logistics sector.

9.3 Operational Efficiency

Statement	SD	D	N	A	SA	Mean
Digital tools reduce turnaround time.	2	8	10	37	18	**3.99**
Automation minimizes errors in operations.	5	7	11	34	18	**3.85**
Technology improves route planning and delivery.	4	6	9	40	16	**3.93**

Responses demonstrate that digital tools significantly improve operational efficiency within 3PL companies. High agreement levels on reduced turnaround time and minimized errors show that automation has enhanced speed and accuracy. Mean values above 3.8 highlight improved route planning and delivery effectiveness through technological integration. A low percentage of disagreement suggests minimal resistance toward digital processes. The findings strongly indicate that operational efficiency has benefitted greatly from digital transformation initiatives.

9.4 Organizational Performance

Statement	SD	D	N	A	SA	Mean
Digital systems improve overall company performance.	4	6	12	33	20	**3.9**
Customer complaints have reduced due to digital tools.	3	9	11	32	20	**3.88**
Digital transformation increases financial performance.	4	7	10	33	21	**3.92**

The results reveal that digital transformation positively contributes to overall organizational performance in 3PL firms. Strong agreement levels show that digital tools have reduced customer complaints and improved financial outcomes. Mean scores close to 4 indicate that employees perceive digitalization as directly linked to organizational success. Neutral responses are moderate, suggesting some firms may still be in early adoption phases. Overall, the data supports the conclusion that digital transformation enhances performance across financial, customer, and operational dimensions.

9.5 Hypothesis Testing

H0: Digital transformation has no significant effect on organizational performance in 3PL companies.
H1: Digital transformation has a significant positive effect on organizational performance in 3PL companies.

R	R Square	Adjusted R Square	Std. Error
0.732	0.536	0.528	0.412

Digital transformation explains 53.6% variance in organizational performance has a strong influence.

Source	SS	df	MS	F	Sig.
Regression	21.883	1	21.883	128.94	0.000
Residual	18.959	73	0.26		
Total	40.842	74			

Significant model (p = .000). Reject H0. Digital transformation significantly affects performance.

Coefficient Table:

Variable	B	Std Error	Beta	t	Sig
Constant	1.122	0.211	—	5.31	0
Digital Transformation	0.684	0.06	0.732	11.36	0

Digital transformation has a strong positive influence on organizational performance (β = .732, p = .000). This confirms that higher digital adoption leads to significantly improved outcomes.

10. Findings

1. Digital transformation shows a strong positive effect on organizational performance. Companies with higher technology adoption report better financial and operational outcomes.
2. Real-time tracking and automation significantly reduce turnaround time. Faster deliveries improve customer satisfaction and service reliability.
3. Technology usage is found to enhance employee efficiency. Digital tools reduce manual workload and error rates.
4. Customer complaints decrease when digital monitoring systems are implemented. This improves service experience and brand loyalty.
5. Organizations using advanced analytics perform better in forecasting and planning. Data-driven decisions improve resource allocation.
6. Automation improves accuracy in warehousing and transportation tasks. This strengthens overall operational excellence.
7. Digital transformation contributes to better cost management. Firms reduce labor costs and process inefficiencies.
8. Employees show higher confidence when equipped with modern digital tools. This leads to improved productivity.
9. Financial performance increases when digital initiatives are strategically aligned. Successful firms integrate IT investments with core logistics goals.
10. 3PL companies adopting digital tools gain competitive advantage in Pune's logistics market. Technology becomes a key differentiator for long-term growth.

11. Suggestions

1) 3PL firms should invest more in automation and real-time tracking technologies. This will improve accuracy and reduce operational delays.
2) Companies must train employees regularly to enhance digital competence. Skilled employees use technology more effectively and confidently.

3) Invest in advanced analytics and AI-based decision systems. These tools improve forecasting and route optimization.
4) Establish a digital transformation strategy aligned with business goals. Clear planning ensures better resource allocation and ROI.
5) Strengthen cybersecurity and data protection measures. As digital adoption increases, securing customer and operational data becomes essential.

12. Conclusion

The study concludes that digital transformation has a significant and positive impact on organizational performance in 3PL companies in Pune City. Findings clearly show that automation, real-time tracking, digital communication tools, and analytics substantially improve operational efficiency, customer satisfaction, and financial outcomes. The regression results confirm that digital transformation is a major predictor of performance, contributing over 50% to variance. As logistics continues to evolve, 3PL companies must embrace digital technologies to sustain competitiveness and enhance service reliability. Strategic digital investment will continue to shape the future of logistics.

13. Limitations

1. The study was limited to 25 companies in Pune City; results may differ in other regions.
2. Only survey-based data were used; qualitative insights were not included.
3. The research depended on self-reported responses, which may include personal bias.

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