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A study on impact of technology on modern logistics with special reference to Jayachandra bearing India private Coimbatore

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Abstract
This study examines the impact of technology on modern logistics with special reference to Jayachandra Bearing India Private Limited, Coimbatore. The primary objective is to evaluate how technological advancements enhance operational efficiency, inventory management, supply chain coordination, and overall customer satisfaction within the organization. Secondary data were utilized to analyse the effectiveness of various technological tools such as automation, digital tracking systems, and warehouse management software in improving logistics performance. The study highlights how the integration of technology reduces lead time, minimizes errors, and optimizes resource utilization. It further reveals the company's current level of technological adoption and provides suggestions to strengthen its logistics capabilities for sustained competitiveness and growth.

Keywords: Technology in logistics, supply chain management, operational efficiency

Introduction
Technology has become an integral part of modern logistics, revolutionizing the way businesses manage the movement, storage, and distribution of goods. In the context of bearing manufacturing units, such as Jayachandra Bearing India Private Limited, Coimbatore, the adoption of advanced logistics technologies plays a crucial role in enhancing efficiency, accuracy, and competitiveness. Modern logistics involves the integration of various technological tools-such as automation, digital tracking systems, warehouse management software, and data analytics-to streamline operations and ensure timely delivery of products.

The impact of technology on logistics can be seen in improved supply chain coordination, better inventory control, reduced operational costs, and enhanced customer satisfaction. By implementing digital solutions, organizations can monitor shipments in real time, optimize routes, and minimize human errors. These advancements not only strengthen overall operational efficiency but also enable companies to adapt to the rapidly changing demands of the global market.

Jayachandra Bearing India Private Limited serves as an excellent example of how technology-driven logistics practices can support sustainable growth and business excellence. This study focuses on analysing the role of technology in transforming logistics operations within the company, identifying challenges in implementation, and suggesting strategies to maximize the benefits of technological integration in logistics management.

Objectives of the study
- To examine the current technologies adopted in the logistics operations of Jayachandra Bearing India Private Limited.
- To analyse the impact of technological advancements on the efficiency, accuracy, and speed of logistics processes.
- To evaluate how technology has influenced inventory management, order processing, and delivery systems.
- To identify the challenges and limitations faced by the company in implementing and utilizing modern logistics technologies.

Review of literature

1. **KPMG (2024):** KPMG (2024) highlights the rapid acceleration of electrification and automation across the logistics transport value chain, emphasizing its transformative impact on both air freight and last-mile delivery operations. The report details how logistics companies are increasingly adopting electric vehicles, automated sorting systems, and robotics to reduce operational costs, improve efficiency, and minimize carbon emissions. A key focus is the evolution of autonomous transportation: while early stages involved vehicles operating under human supervision, recent advancements are enabling fully autonomous vehicles capable of operating independently, without human intervention. This shift represents a significant technological leap in logistics, promising faster deliveries, enhanced accuracy, and optimized resource utilization. Additionally, KPMG notes that the integration of these technologies not only improves operational performance but also positions organizations to meet growing regulatory and environmental sustainability demands, highlighting the critical role of innovation in shaping the future of logistics.
2. **Okwubali *et al*. (2024):** Okwubali *et al*. (2024), in their study published on ResearchGate, examine the role of technological innovations in transforming logistics and supply chain management. The research highlights how modern technologies-including automation, Artificial Intelligence (AI), the Internet of Things (IoT), and advanced data analytics-have significantly improved operational efficiency by streamlining processes, minimizing human errors, and optimizing resource allocation. Additionally, these technologies have enhanced transparency across the supply chain, allowing real-time tracking of goods, improved inventory visibility, and better communication among stakeholders. The study also emphasizes the contribution of technology to sustainability, demonstrating how intelligent logistics planning can reduce energy consumption, lower carbon emissions, and minimize waste in transportation and warehousing.

Data Analysis and Interpretation

Table 1: Showing Age of respondents

Age Group	No. of Respondents	Percentage (%)
18–25	20	25%
26–35	28	35%
36–45	16	20%
46–55	12	15%
Above55	4	5%
Total	80	100%

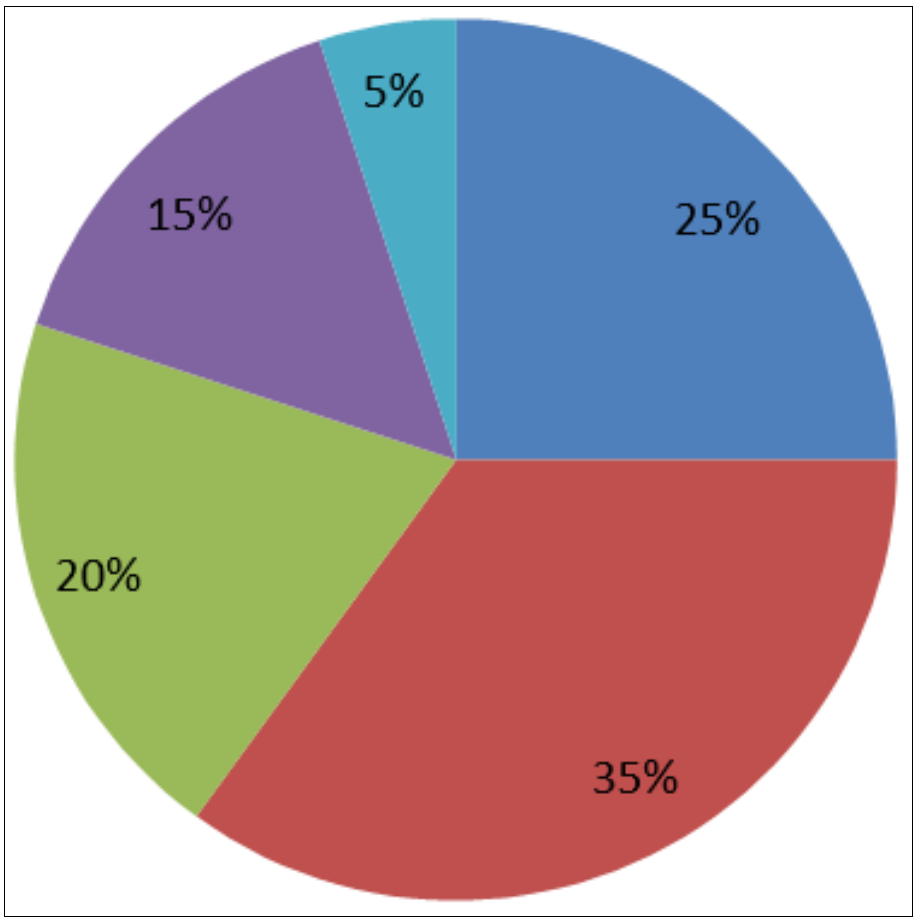

Fig 1: Chart showing age of respondents

Interpretation

The majority of respondents fall in the 26–35 age group (35%), followed by those below 25 (25%). This indicates that the logistics workforce is relatively young and tech-adaptive.

Distribution of Respondent Opinions with Chi-Square Test
There is a need for more training and awareness on new technologies
Hypothesis

- **H_0:** There is no significant relationship between experience and need for training and awareness.
- **H_1:** There is a significant relationship between experience and need for training and awareness.

Response	No. of Respondents (O)	Percentage (%)	Expected(E)	$(O-E)^2/E$
Strongly Agree	30	37.5%	16	12.25
Agree	28	35.0%	16	9.00
Neutral	12	15.0%	16	1.00
Disagree	7	8.7%	16	5.06
StronglyDisagree	3	3.8%	16	10.56
Total	80	100%	-	37.87

Chi-Square Test Summary

- Degrees of freedom (df) = 4
- Critical value at 5% significance = 9.488
- **Decision:** Since 37.87 > 9.488, reject the null hypothesis.
- **Conclusion:** Respondents' opinions are not equally distributed; there is a significant preference toward certain responses.

Interpretation

Almost 73% agree more training is needed, showing skill-building is a universal demand.

Findings

- Majority of respondents (35%) are in the 26–35 age group, followed by 25% in the 18–25 group, showing that the logistics workforce is relatively young and adaptive to technology.
- 65% of respondents are male and 35% female, indicating that logistics is male-dominated, though female participation is steadily increasing.
- 40% of respondents work in logistics, while others are from operations (25%), IT (20%), and management (15%), ensuring balanced departmental representation.
- Most respondents (40%) have 1–5 years of experience, followed by 25% with 5–10 years, showing that mid-level professionals dominate the workforce.
- A large majority (80%) agree that modern logistics technologies are widely adopted, reflecting strong acceptance of digital transformation.

Suggestions

- Organizations should provide career development programs for younger employees to nurture their potential, while also encouraging knowledge transfer through mentorship programs led by experienced staff. This balance will ensure continuity and innovation.
- Logistics firms should actively encourage the participation of women by organizing targeted recruitment drives, offering equal career advancement opportunities, and introducing flexible work policies that support work–life balance.
- To strengthen coordination, companies can create inter-departmental committees to foster collaboration and adopt ERP systems that allow seamless data sharing across different functions. This will reduce silos and enhance efficiency.
- Mid-level employees should be supported with leadership and decision-making training, while senior staff can be retained with attractive incentives and recognition programs. This ensures talent retention and career progression within the organization.

Conclusion

The study clearly reveals that the adoption of technology has brought a remarkable transformation in logistics operations. It has streamlined and enhanced various functions such as inventory control, delivery speed, real-time tracking, inter-departmental coordination, error reduction, cost optimization, and customer satisfaction. These improvements demonstrate that technology plays a crucial role in creating operational efficiency and delivering value both to organizations and customers.

Notably, the workforce, particularly respondents in the 26–35 age group with mid-level professional experience, has shown strong adaptability and a positive attitude toward embracing modern logistics technologies. This indicates that younger employees and mid-level professionals are acting as the driving force behind digital adoption in the logistics sector.

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