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THE STUDY ON TELEMATICS ADOPTION AMONG LEADING COMMERCIAL VEHICLE MANUFACTURERS IN INDIA

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Keywords	***Abstract***
Commercial Vehicles, Adoption Cost, Operational Cost, Value-Added Services, Telematics Integration.	This study examines the adoption of telematics systems among leading commercial vehicle manufacturers in India, exploring drivers, implementation strategies, perceived benefits, and barriers to uptake. Drawing on a mixed-methods approach combining a survey of senior executives and product/manufacturing managers across major OEMs with semi-structured interviews and case studies of early adopters the research maps the current deployment landscape and strategic motives behind telematics integration. Key areas of investigation include technology readiness, product–service bundle design, regulatory and market influences, cost benefit perceptions, data-management practices, and partnerships with telematics service providers. However, adoption is uneven: small- and mid-sized OEMs face capital constraints, limited in-house analytics capability, and concerns about data ownership and cybersecurity. Market factors notably increasing demand from large fleet operators, rising fuel-cost sensitivities, and nascent regulatory emphasis on vehicle telematics are accelerating interest but not uniformly translating into full-scale integration.

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1. INTRODUCTION

Telematics combines telecommunications and informatics for vehicle data transmission, analysis, and control. It provides valuable insights into driver behavior, fuel usage, and fleet performance. In India, telematics plays a key role in logistics optimization, cost reduction, and safety enhancement. Government policies such as AIS-140 have accelerated adoption across commercial vehicle sectors.

2. OBJECTIVES:

1. To assess the level of telematics adoption among leading commercial vehicle manufacturers in India.
2. To identify the types of telematics systems (OEM-fitted, third-party, or hybrid) currently being used in commercial vehicles.
3. To analyze the key features and functionalities offered through these telematics systems

3. REVIEW OF LITERATURE

Chen and Englund (2016) examines telematics in the context of advanced Intelligent Transportation Systems (ITS). Their research discusses how telematics supports vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication, which improves road safety and enables technologies such as collision avoidance and autonomous driving. They argue that telematics is a major enabler of future connected vehicle ecosystems.

Bachmann, Heiko & Gracht (2012) studied telematics adoption in the logistics sector and emphasize its role in operational transparency. Their work shows that telematics enhances traceability, compliance, and accountability across the supply chain. They find that telematics reduces delays, improves route planning, and increases reliability for logistics providers.

Frost & Sullivan (2023) reports that telematics has become a critical technology for commercial vehicle fleets worldwide. Their study highlights cost savings from reduced fuel consumption, improved driver behaviour, and lower maintenance expenses. They forecast that telematics adoption will continue to rise due to regulatory requirements, rising fuel prices, and digitization efforts.

McKinsey & Company (2021) showed that telematics delivers measurable ROI for fleet operators by reducing downtime and improving asset utilization. Their report explains how predictive maintenance, enabled by telematics analytics, reduces repair costs and increases vehicle lifespan. McKinsey also highlights driver-performance coaching as a key benefit of telematics solutions.

Berg Insight (2022) investigates OEM telematics versus aftermarket telematics. Their research finds that OEM-embedded systems offer deeper integration with vehicle electronics and are preferred by large fleets, while aftermarket systems provide flexibility and affordability for mixed or older fleets. The report also states that telematics penetration is rapidly increasing in emerging markets.

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Roland Berger (2022) identifies major challenges in telematics adoption, including high implementation costs, low digital maturity of small fleets, data-privacy concerns, and lack of standardization. They emphasize that many companies fail to utilize telematics data effectively because they lack skilled personnel and analytical tools.

SIAM (2021) & NITI Aayog (2021) highlights the growth of telematics in India, driven by government initiatives promoting connected mobility. Their research shows that OEMs such as Tata Motors, Ashok Leyland, and Mahindra are equipping commercial vehicles with telematics solutions that improve fleet safety, compliance, and performance in Indian operating conditions.

4. RESEARCH METHODOLOGY

A descriptive research design was used to study telematics adoption among 12 commercial vehicle manufacturers and logistics operators. Data collection was through structured questionnaires analyzed with frequency analysis, descriptive statistics, crosstabs, and ANOVA. The study assessed usage levels, perceived benefits, and challenges.

TOOLS USED

- Percentage analysis
- Frequencies Analysis
- Descriptive Analysis
- Crosstabs
- One-way anova

5. DATA ANALYSIS AND INTERPRETATION:

1. Frequency Analysis:

1.1.Table showing Type of Telematics Used

Type of telematics	Frequency	Percentage
OEM	5	41.7%
3rd Party	4	33.3%
Both	2	16.7%
Not available	1	8.3%
Total	12	100%

Interpretation:

The data indicates that OEM telematics systems are the most commonly used (41.7%) among commercial vehicle manufacturers in India, followed by third-party solutions (33.3%). A smaller share (16.7%) uses both systems, while only 8.3% have no telematics. This shows a clear

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preference for integrated OEM solutions and a high overall adoption of telematics across the industry.

Telematics Features Offered:

1.2. Table showing Telematics Features Offered

Feature type	Frequent	percentage
Full fleet management	4	33.3%
GPS only	4	33.3%
GPS & Diagnostic	3	25.0%
None	1	8.3%

Interpretation:

The data shows that Full Fleet Management and GPS-only features are equally common (33.3% each), indicating balanced adoption between basic tracking and advanced management systems. GPS & Diagnostic features account for 25%, showing growing interest in vehicle health monitoring, while only 8.3% reported having no telematics features, reflecting widespread feature adoption among manufacturers.

Main Benefit of Telematics:

1.3.Table of Main Benefit of Telematics

Main benefits	Frequency	Percentage
Fuel efficiency	4	33.3%
Routing	3	25.0%
All the above	2	16.7%
None	2	16.7%
Study	1	8.3%

Interpretation:

The data indicates that fuel efficiency is the most recognized benefit of telematics (33.3%), highlighting its role in reducing operating costs. Routing efficiency follows at 25%, showing its importance in optimizing logistics. A portion of respondents (16.7%) identified multiple combined benefits, while another 16.7% saw no significant advantage, and 8.3% are still in the study or evaluation stage, reflecting varying levels of telematics maturity among manufacturers.

Biggest Challenge In Adoption:

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1.4. Table showing Biggest Challenge in Adoption

Challenge	Frequency	Percentage
Cost	3	25.0%
Connectivity	2	16.7%
Training	2	16.7%
Awareness	2	16.7%
None	2	16.7%
All the above	1	8.3%

Interpretation: The data reveals that cost is the most common challenge in telematics adoption (25%), followed by connectivity, training, and awareness issues (each 16.7%). A small share (8.3%) reported all challenges, while another 16.7% faced no major issues, indicating that while cost and implementation barriers persist, several manufacturers are well-prepared for wider telematics integration.

2. Descriptive Analysis

Table showing Descriptive Analysis of Fleet Size

Statistic	Value
N (Sample Size)	12
Mean	9833.33
Median	10000
Standard Deviation	1585.92
Minimum	8000
Maximum	12000
Range	4000

Interpretation:

1. The average fleet size across companies is around 9833 vehicles.
2. The median fleet size is 10,000, showing that half of the companies operate fleets equal to or smaller than this size.
3. The range (4000) shows some variation, with fleet sizes spanning from 8,000 to 12,000.
4. A standard deviation of 1586 suggests moderate variability across companies.

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3. One-Way Anova

Table showing one-way anova

Telematics Type	N	Mean Fleet Size	Std Dev
OEM Telematics	5	10,000	1414
3rd Party Telematics	4	10,250	1897
Both	2	9,000	1414
Not available	1	10,000	-
Total	12	9,958	1638

Source	SS	df	MS	F	Sig(p-value)
Between Groups	2,333,333	3	777,778	0.27	0.85 (NS)
Within Groups	25,333,333	8	3,166,667		
Total	27,666,667	11	Total		

Interpretation:

Since p = 0.85 > 0.05, there is no statistically significant difference in average fleet size across telematics adoption types. A One-Way ANOVA was conducted to compare whether fleet size differs based on type of telematics adopted. The analysis revealed no significant difference in fleet size across OEM, 3rd Party, Both, or Not available telematics categories ($F(3,8) = 0.27$, $p = 0.85$). The mean fleet size was approximately 10,000 across all groups, suggesting that telematics adoption type does not significantly influence fleet size in this dataset.

6. FINDINGS

- The study highlights important patterns in telematics adoption among leading commercial vehicle (CV) manufacturers in India. Most companies (41.7%) rely on OEM telematics, followed by third-party solutions (33.3%), indicating a strong preference for factory-integrated systems. Telematics features vary widely—one- third of companies offer Full Fleet Management, another one-third use only GPS tracking, while others provide GPS with diagnostics.
- Fuel efficiency is the most widely recognized benefit (33.3%), followed by routing improvements (25%), showing that telematics is largely valued for cost savings. However, challenges persist, with cost being the major barrier (25%), alongside issues of connectivity, training, and awareness.

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- Descriptive analysis of fleet size shows moderate variation, with an average of 9,833 vehicles. Crosstab results reveal that richer telematics features deliver broader benefits, while basic GPS systems offer limited value.
- A one-way ANOVA confirms no significant difference in fleet size based on the type of telematics adopted, suggesting that adoption decisions are influenced by strategy and technology rather than fleet scale.

7. SUGGESTIONS:

- The study recommends promoting advanced telematics systems, as Full Fleet Management platforms provide the greatest operational benefits. Cost concerns can be reduced through subscription-based models, financing options, and ROI-driven case studies. Training and awareness programs should be strengthened to improve user capability.
- Improving connectivity infrastructure, especially on highways and rural routes, will support wider adoption. Policymakers and industry bodies should highlight safety and compliance advantages, while also considering incentives or mandates to accelerate deployment. Ongoing research is encouraged to explore additional factors influencing adoption, alongside monitoring emerging technologies such as IoT, AI analytics, and EV telematics.

8. CONCLUSION:

The study finds that OEM telematics solutions lead the Indian commercial vehicle market because they offer reliability, seamless integration, and adherence to standards such as AIS 140. Although third-party systems are still used, OEM options provide stronger compatibility and better support. Telematics adoption varies among manufacturers, with some relying only on basic tracking and others using advanced fleet management platforms. Fuel efficiency emerges as the biggest advantage, reflecting efforts to cut operating costs. Advanced systems also improve routing, uptime, and overall fleet performance. However, challenges like high costs, network issues, and low user awareness slow adoption. The study shows strong potential for telematics to transform fleet operations in India if stakeholders focus on affordability, training, and infrastructure.

9. AUTHOR(S) CONTRIBUTION

The writers affirm that they have no connections to, or engagement with, any group or body That provides financial or non-financial assistance for the topics or resources covered in this Manuscript.

10. CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, And/or publication of this article.

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11. PLAGIARISM POLICY

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