

FREIGHT MANAGEMENT SYSTEMS AND LOGISTICS COST REDUCTION: EVIDENCE FROM RANE MADRAS LIMITED

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Transportation costs are a problem for companies that make things. They want to spend money on transportation without making their service worse. This study looks at how a Freight Management System works at Rane Madras Limited. This company makes parts for cars. Is based in Chennai.

The study asked 120 employees for their thoughts. Used special tools to analyze the data. These tools included looking at the average of some numbers. How different things are related to each other. The study wanted to know if using a Freight Management System really helps with things like planning the route using less fuel being able to see where shipments are and controlling costs.

The results show that using a Freight Management System does help make logistics better. However it helps some things more than others. The system is really good at planning the route and saving money on fuel. It is not as good at making deliveries

The study ends with some ideas for making the system work better and, for making logistics better too.

Keywords: Freight Management System, Logistics Cost Reduction, Route Optimization, Transportation Efficiency, Supply Chain Management, Automotive Industry

1. Introduction

Running a factory is a job and it involves a lot of work with delivery costs. We need to get materials to the factory and finished products to customers. Every step of the way costs money. Fuel, workers and taking care of vehicles. In the car business these problems are even bigger because of the way they make things, which is called Just-in-Time. If something is late it can stop the factory. So how a company handles its deliveries is very important for making money and being competitive.

For a time companies in India did deliveries the old way. They would call the trucking companies use paper for everything and decide which route to take based on what they knew not on data. This worked okay when things

were simple. It did not work well when things got complicated. What happened a lot was that they would take routes that were not the best the trucks would not be used much as they could be things would be late and they could not track what was going on.

Then something called Freight Management Systems came along. It is a computer system that helps with planning routes working with trucking companies tracking deliveries and doing paperwork. It promises to make deliveries more efficient and organized. The question is, does it really work?. If it does how does it work?

This study looks at a company called Rane Madras Limited. They make parts for cars like steering and suspension systems. They have to work with a lot of suppliers and customers so deliveries are very important. We asked 120 people at the company about how they use Freight Management Systems and we looked at the numbers to see how it has helped with deliveries.

About Rane Madras Limited the company was started in 1960. It is now one of the well-known companies in India that makes car parts. They make things like steering parts and suspension systems for car companies. Their factories are in places in India and they make sure their products are as good as what is made in other countries. Deliveries are a part of what they do. They need to get materials from suppliers on time. They need to get their products to car companies without any problems. They have been using computer systems like Freight Management Systems to make deliveries better, faster and cheaper. This makes them a good company to study to see how well Freight Management Systems work.

1.1 About the Company

Rane Madras Limited was started in 1960. It has become one of the biggest companies in India that makes car parts. They are listed on the BSE and NSE. They make parts for car companies. Their factories are in places in India and they make sure their products are as good, as what is made in other countries.

Logistics is a part of what Rane Madras Limited does. They need to get materials from suppliers on time. They need to get their products to car companies without any problems. They have been using computer systems like Freight Management Systems to make deliveries better, faster and cheaper. This makes them a good company to study to see how well Freight Management Systems work.

2. Objectives of the Study

The study is based on the following objectives:

- To look at the freight management practices that Rane Madras Limited is currently using.
- To find out what makes transportation and freight costs go up.
- To see how Freight Management Systems help reduce the money spent on logistics.
- To check how route planning and real-time shipment tracking features work
- To suggest ways to improve logistics and manage costs better.

3. Review of Literature

There has been a lot of research on freight and transportation management in the ten years. Most of the studies say that digital logistics tools make things more efficient but how well they work depends on how they're used.

Hofmann and Osterwalder talked about cloud-based Freight Management Systems in 2020. They said these systems help people work together better. When everyone has the information, mistakes and extra work go down.

Brown and Garcia found out that companies that use Transportation Management Systems can cut their freight costs by 10%. This happens because there are mistakes and people work together better. However they also said that it is important to train employees to use these systems.

Nguyen and Lee looked at how technology can help in 2021. They found out that predictive analytics and AI-assisted route optimization can save fuel and reduce miles.

Dubey and others also found out that AI-enabled Freight Management Systems can help. They said that route planning and shipment consolidation can be improved.

Bag and others looked at how these systems work in emerging markets. They found out that companies need to be ready to use technology to benefit from logistics tools.

Later studies went deeper into these topics. Kache and Seuring talked about how big data analytics can help forecast and reduce waste in logistics.

Dolgui and others said that digital tools can help make supply chains more flexible. This means that transportation plans can be changed in time when something goes wrong.

Winkelhaus and Grosse Industry 4.0 technologies with reductions in downtime and delays.

More recent studies have looked at areas. Min described how Transportation Management Systems have become more advanced. They can now help make decisions and cut freight spending.

Sodhi and Tang emphasized the importance of risk management. Freight Management Systems can help companies spot cost risks.

Ivanov introduced twin technology as a way to simulate freight operations before making changes.

By 2025 AI-driven routing and sustainability-oriented freight planning had become important areas of research. Both of these areas have been linked to cost reduction.

All of these studies suggest that using Freight Management Systems can improve logistics performance. However the results depend on the quality of the system the skills of the employees and how well the system fits into the company's processes.

4. Research Methodology

4.1 Research Design

This study uses a research design. The goal is to describe and analyze the state of freight management at Rane Madras Limited. This includes looking at what practices are being used how employees feel about them and where the system is not working well.

This approach fits the objectives of the study because the goal is to provide insights that can inform decisions.

4.2 Population and Sample

The study includes employees and individuals who are involved in logistics and freight management activities. A total of 120 respondents were surveyed. The sample includes people from manufacturing, retail, e-commerce and FMCG sectors with a focus, on manufacturing.

4.3 Data Collection

We collected data using a questionnaire that had closed-ended and Likert-scale questions. The questionnaire asked about how people use the system what features it has and what people think about how FMS affects logistics. We also got data from company records, research journals and industry reports. We did this from January to April 2026.

4.4 Analytical Tools

We used four tools to understand the data. We looked at the percentage of people who answered ways to see who the respondents were and how they used the system. We used the average method to turn Likert responses into scores that we could compare. We ranked these scores to see which parts of FMS people thought were most important. Then we used correlation analysis to see if some variables were related, like if route optimization scores were related to fuel cost reduction scores.

5. Data. Findings

5.1 Respondent Profile

We had 120 people answer the questionnaire. It was evenly split between females and males. 61 Females and 59 males. Most people were from the manufacturing industry. 43 Percent. Then came retail at 23 percent and e-commerce and FMCG at 17 percent each. When we asked about FMS 71 percent of people said their company uses Freight Management System.. Of those people half said they use it every day. Freight Management System is used a lot. We wanted to know more, about how people use Freight Management System.

Gender	Frequency	Percentage (%)
Female	61	51%
Male	59	49%
Total	120	100%

Table 1: Gender Distribution of Respondents

Industry Sector	Frequency	Percentage (%)
Manufacturing	52	43%
Retail	28	23%
E-commerce	20	17%
FMCG	20	17%
Total	120	100%

Table 2: Industry Type of Respondents

FMS Usage	Frequency	Percentage (%)
Yes	85	71%
No	35	29%
Total	120	100%

Table 3: FMS Adoption Among Respondents

Frequency of Use	Frequency	Percentage (%)
Daily	60	50%
Weekly	35	29%
Occasionally	25	21%
Total	120	100%

Table 4: Frequency of FMS Usage

5.2 Weighted Average Analysis

Respondents rated ten aspects of FMS performance on a five-point scale. The weighted averages, summarized below, give a sense of where the system is delivering and where it is not.

Factor	Weighted Average
Has FMS improved route optimization?	4.15
The system provides real-time shipment visibility	3.83
The system has improved overall financial performance	4.12
Fuel costs have decreased due to the use of the system	3.94
Efficient route planning contributes to cost reduction	3.94
Resource utilization has improved due to the system	4.07
Data accuracy has improved after FMS implementation	3.91
Delivery time has reduced due to better route optimization	3.83
The current FMS has limited functionality for optimizing routes	3.28
FMS supports better decision-making through real-time analytics	3.87

Table 5: Weighted Average Scores for FMS Performance Factors

Route optimization is the best with a score of 4.15. This is not a surprise because people think that better route planning is one of the obvious benefits of a freight system. They can see it. Measure it easily. Financial performance improvement got a score of 4.12 and resource utilization got a score of 4.07. These three things show that the system is really helping the organization make the most of its money spent on logistics.

On the hand delivery time reduction and real-time shipment visibility both got a score of 3.83. This is not bad. It is not as good as the things that save money. Route optimization and financial performance improvement are more important to people. The score, for system limitations was 3.28. This means that people think the current freight management system is not perfect when it comes to route optimization. They think it needs to be improved or expanded. This shows that there is room to make the system better. Route optimization is still the important thing..

5.3 Rank Correlation Analysis

Rank	Factor	Weighted Average
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1	Route optimization improvement	4.15
2	Overall financial performance improvement	4.12
3	Resource utilization improvement	4.07
4	Fuel cost reduction (route-linked)	3.94
4	Route planning and cost reduction	3.94
6	Data accuracy post-FMS	3.91
7	Decision-making via real-time analytics	3.87
8	Real-time shipment visibility	3.83
8	Delivery time reduction	3.83
10	Perceived system limitations in routing	3.28

Table 6: Rank Correlation of FMS Impact Factors

The ranking reinforces what the weighted averages already suggested. Cost and efficiency gains cluster at the top; delivery speed and system limitations sit lower. The gap between rank 1 (4.15) and rank 10 (3.28) is meaningful—it points to a system that is strong in cost-related areas but has not fully delivered on all operational fronts.

5.4 Correlation Analysis

Variable Pair	Correlation (r)	Interpretation
Real-time shipment visibility vs. Delivery time reduction	0.324	Moderate positive
Route optimization vs. Fuel cost reduction	0.228	Slight positive
Financial performance vs. Resource utilization	0.248	Slight positive

Table 7: Correlation Analysis Results

None of the numbers showing how things are related are strong. All are good. The strongest link is between knowing where a shipment is in time and reducing delivery time ($r = 0.324$) which makes sense. When you can see where a shipment is you can do something to prevent delays. The link between finding the route and saving fuel ($r = 0.228$) is good but not great which might be because fuel costs depend on many things like driver behavior, vehicle condition, traffic and fuel prices.

There is a good link between how well the company is doing financially and using resources well ($r = 0.248$). This means these two things move together. One is not just a simple result of the other. Overall the numbers are consistent with a system that has effects but its impact is affected by many organizational and environmental factors.

6.

This study aimed to understand if using a Freight Management System at Rane Madras Limited made a difference in logistics costs and efficiency. The answer, based on survey data from 120 people and three types of analysis is yes.. With some conditions.

The clearest benefits were finding the routes and saving fuel. People rated these factors highest. They align with what FMS technology is good at: finding efficient routes reducing empty miles and cutting unnecessary fuel spend. Performance and resource utilization also scored well suggesting that the cost savings from better logistics are helping the companys bottom line.

Where the system showed impact was in delivery speed and advanced decision support. These are not failures. The scores were still above neutral.. They indicate that just having an FMS is not enough to solve every logistics problem. Delivery performance depends on factors outside the systems control like traffic conditions and customer location constraints. Decision support through analytics requires not just the technology but people to interpret and act on the data.

The numbers reinforce this picture. The relationships between variables are good but modest pointing to a situation where FMS is one helpful component in a larger logistics ecosystem rather than a magic solution. That is arguably the view: no single system resolves all logistical complexity but this one is contributing meaningfully.

7. Suggestions

Based on the analysis here are some recommendations for improving freight management effectiveness at Rane Madras Limited:

* Upgrade route optimization capabilities: The moderate score on system limitations suggests the current FMS may not be using the advanced routing algorithms available. Exploring AI-based or machine learning-enhanced routing could close this gap.

* Invest in analytics training: The decision-support aspect of FMS scored lower. This is often less about system capability and more about user readiness. Targeted training on how to read and act on FMS-generated reports would help extract value from existing features.

* Integrate FMS with real-time traffic and weather data: Delivery time reduction was one of the performing factors. Connecting the FMS to external data feeds. Traffic, weather alerts, road closure notifications. Could improve the systems ability to dynamically reroute and avoid delays.

* Link FMS data with ERP systems: Disconnected systems create spots. Integrating freight management data with the company's ERP would give finance and supply chain teams a view of costs and performance enabling better planning decisions.

* Track fuel management separately: Given that route optimization and fuel cost reduction showed a slight correlation it would be worth monitoring fuel consumption as an independent KPI rather than assuming route improvements will automatically translate into fuel savings.

* Establish performance reviews: Freight management is not a set-and-forget function. Monthly or quarterly reviews of FMS performance metrics. Covering route efficiency, fuel usage, delivery adherence and system uptime. Would help identify emerging issues before they become costly.

* Collect user feedback: Employees who use the system daily often have the insights into where it falls short. A simple recurring feedback mechanism would surface improvement ideas and increase user ownership of the system.

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