

A STUDY ON DEMAND FORECASTING TECHNIQUE AND THEIR EFFECTIVENESS TOWARDS FALCON INDIA LINES PVT. LTD., CHENNAI

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Abstract— Demand forecasting is a critical driver of efficient supply chain management. This study examines the demand forecasting techniques and their effectiveness at Falcon India Lines Pvt. Ltd., a leading logistics company headquartered in Chennai. The primary objective is to assess how demand forecasting contributes to production planning, material resource planning, and overall supply chain implementation. A descriptive research design was adopted with a convenience sampling technique. Data were collected from 100 respondents using a structured questionnaire. Statistical tools including percentage analysis, chi-square test, ANOVA, regression analysis, and correlation analysis were employed. The findings reveal that 80% of respondents use demand forecasting for production planning, 70% affirm that forecasting methods enhance efficiency, and 66% utilize material resource planning for purchasing decisions. A significant association between educational qualification and supply chain management implementation was identified. The study concludes that effective demand forecasting and material resource planning are indispensable for achieving supply chain excellence in the logistics sector.

Keywords: *Demand Forecasting, Supply Chain Management, Material Resource Planning, Logistics, Production Planning, Inventory Control.*

I. INTRODUCTION

Demand forecasting refers to the practice of estimating the quantity of a product or service likely to be procured by consumers over a specified time horizon. According to Prof. Philip Kotler, "The Company (Sales) forecast is the expected level of company sales based on a chosen marketing plan and assumed marketing environment." Similarly, Evan J. Douglas defines it as "a process of finding values for demand in future."

In today's competitive supply chain landscape, uncertainty and variability in customer demand represent a primary operational challenge. Surprise changes in demand can disrupt scheduling, inventory management, capacity planning, and order fulfillment across an entire supply chain. Demand forecasting brings structure to this uncertainty by enabling organizations to anticipate future consumption patterns and align their resources accordingly.

For logistics service providers such as Falcon India Lines Pvt. Ltd., accurate demand forecasting determines decisions in warehouse space allocation, staffing, transportation scheduling, and procurement. The study of demand forecasting techniques and their effectiveness is therefore crucial to understanding how logistics firms can improve operational efficiency and customer satisfaction.

II. REVIEW OF LITERATURE

Dr. Anitha M.N. (2025) examined the impact of Goods and Service Tax (GST) on the logistics sector in India, analysing data from 396 respondents using mean reliability analysis and correlation, finding that GST significantly affected transportation, warehousing, and service providers.

Norlinda Mohd Rozar and Wan Hasrulnizam Wan Mahmood (2024) studied success factors in Green Supply Chain Management in Malaysian manufacturing industries, highlighting the importance of environmental responsibility alongside operational efficiency.

R. Mahesh and P. Suresh (2023) explored logistics and competitive advantages in the retail sector, concluding that packaging, labelling, and reverse logistics provide significant competitive advantages over rival firms.

Rajeev Kumar (2023) evaluated supply chain performance measurement in dairy supply chains, identifying four key dimensions: efficiency, flexibility, responsiveness, and food quality as performance components.

S. Ramachandran et al. (2021) examined logistics challenges and scope in India using a sample of 300 respondents, emphasizing the need for excellence in logistics management to remain competitive.

Lan Wang (2019) studied business model innovation in logistics firms through case analysis, concluding that macro-environmental analysis guides logistics companies in creating new, sustainable business models.

Md. Mamun Habib (2010) reviewed supply chain management theory and future perspectives, finding that SCM has evolved from production and inventory management to encompass strategic integration across manufacturing and service industries.

III. OBJECTIVES OF THE STUDY

The study was designed with the following specific objectives:

1. To focus on the concept of demand forecasting and material resource planning at Falcon India Lines Pvt. Ltd.
2. To portray the personal and organisational factors influencing supply chain management practices.
3. To compare and contrast the key factors affecting production and manufacturing.
4. To codify the barriers in the implementation of supply chain management.
5. To analyse the transportation and packaging challenges faced by the company.

IV. RESEARCH METHODOLOGY

A descriptive research design was adopted for this study. The research is exploratory and descriptive in nature, investigating demand forecasting techniques and their effectiveness within the logistics sector. The study utilised convenience sampling as the primary method of data collection.

Sample Size: A total of 100 respondents from Falcon India Lines Pvt. Ltd. and associated logistics companies in Chennai District were surveyed.

Data Collection: Both primary and secondary data were used. Primary data were collected through a structured, closed-ended questionnaire. Secondary data were sourced from books, journals, websites, and relevant publications on supply chain management.

Statistical Tools: The following statistical tools were applied: (i) Percentage Analysis, (ii) Chi-Square Test, (iii) ANOVA, (iv) Regression Analysis, and (v) Correlation Analysis. All data were processed using SPSS software.

V. DATA ANALYSIS AND INTERPRETATION

Demographic Profile

Table 1 presents the demographic profile of the 100 respondents surveyed in this study.

Table 1: Demographic Profile of Respondents

Variable	Category	No. of Respondents	Percentage (%)
Age	Below 25 years	70	70.0
	25–40 years	30	30.0
Gender	Male	44	44.0
	Female	56	56.0
Place of Residence	Rural	78	78.0
	Urban	20	20.0
	Semi-Urban	2	2.0
Educational Qualification	School Level	24	24.0
	Graduate/Diploma	40	40.0
	PG Level	18	18.0
Nature of Job	Professionals	16	16.0
	Self Employed	60	60.0
Monthly Income	Employed	30	30.0
	< Rs.10,000	34	34.0
	Rs.10,001–15,000	62	62.0

The majority of respondents (70%) belonged to the age group below 25 years, with females constituting the majority (56%). A large proportion (78%) were from rural areas, and 40% held graduate or diploma qualifications. Most respondents (60%) were self-employed, and 62% earned between Rs.10,001 and Rs.15,000 per month.

Demand Forecasting Practices

Table 2: Use of Demand Forecasting for Production Planning

Response	No. of Respondents	Percentage (%)
Yes	80	80.0
No	20	20.0
Total	100	100.0

A significant majority (80%) of respondents confirmed using demand forecasting for production planning, highlighting the central role of forecasting in logistics operations. Furthermore, 70% stated that demand forecasting methods affect the efficiency of forecasting, and 56% reported that forecasting had helped their organisation improve procurement procedures.

Table 3: Period Considered for Demand Forecasting

Forecasting Period	No. of Respondents	Percentage (%)
Short Term	50	50.0
Medium Term	30	30.0
Long Term	18	18.0
Very Long Term	2	2.0
Total	100	100.0

Half (50%) of the respondents preferred short-term forecasting periods, reflecting the dynamic and fast-changing nature of the logistics industry. Short-term forecasts are particularly useful for managing sudden demand surges, scheduling, and inventory replenishment decisions.

Material Resource Planning

Table 4: Use of Material Resource Planning for Purchasing

Response	No. of Respondents	Percentage (%)
Yes	66	66.0
No	34	34.0
Total	100	100.0

Two-thirds (66%) of the respondents used material resource planning (MRP) for purchasing decisions. Among MRP users, the primary reason cited was inventory control (50%), followed by procurement of raw materials (16%), scheduling (20%), and product structure (14%), demonstrating MRP’s multifaceted utility in logistics.

Chi-Square Analysis

Chi-square tests were applied to examine associations between demographic variables and key operational dimensions. Selected results are summarised in Table 5.

Table 5: Chi-Square Test Results (Production & Manufacturing)

Demographic Variable	Chi-Square Value	df	Table Value (5%)	Result
Age	0.157	2	5.991	Not Significant
Gender	1.014	2	5.991	Not Significant
Place of Residence	20.178	4	9.488	Significant*
Educational Qualification	19.747	8	15.507	Significant*
Type of Family	9.143	2	5.991	Significant*

Nature of Job	9.451	6	12.592	Not Significant
Monthly Income	6.322	4	9.488	Not Significant
Size of Family	13.168	4	9.488	Significant*
Earning Members in Family	12.883	2	5.991	Significant*

*Significant at 5% level. The analysis reveals that place of residence, educational qualification, type of family, size of family, and earning members in the family are significantly associated with production and manufacturing outcomes. Gender, age, nature of job, and monthly income do not show significant associations.

ANOVA

One-way ANOVA was applied to determine whether demographic differences influence the level of supply chain management implementation. Table 6 presents a summary of p-values.

Table 6: ANOVA Results – Implementation of Supply Chain Management

Variable	F Value	p Value	Result
Age	0.199	0.820	Not Significant
Gender	1.313	0.274	Not Significant
Place of Residence	1.098	0.338	Not Significant
Educational Qualification	6.600	0.002	Significant*
Type of Family	0.144	0.866	Not Significant
Nature of Job	11.283	0.000	Significant*
Monthly Income	1.041	0.357	Not Significant
Size of Family	1.883	0.158	Not Significant
Earning Members in Family	2.010	0.140	Not Significant

*Significant at 5% level. Educational qualification (p = 0.002) and nature of job (p = 0.000) significantly influence the level of supply chain management implementation. These findings suggest that higher education and specific employment characteristics are associated with more robust SCM practices.

Regression Analysis

Multiple regression analysis was conducted to assess the predictive relationship between demographic variables and supply chain management implementation.

Table 7: Regression Model Summary

R	R Square	Adjusted R Square	Std. Error	F Value	Sig.
0.351	0.123	0.036	0.806	1.407	0.197

The regression model yielded $R = 0.351$ and $R^2 = 0.123$, indicating that the demographic variables collectively explain approximately 12.3% of the variability in supply chain management implementation. The regression equation is:

$$SCM\ Implementation = 1.783 + 0.008(Age) - 0.137(Gender) - 0.305(Place) - 0.092(Education) - 0.155(Family\ Type) - 0.118(Job) - 0.082(Income) + 0.275(Family\ Size) + 0.732(Earning\ Members)$$

Among the predictors, earning members in the family (Beta = 0.383, $p = 0.003$) was the only statistically significant predictor, suggesting that households with multiple earners are more likely to implement advanced supply chain practices.

Correlation Analysis

Table 8: Correlation Matrix

Variable	Production & Manufacturing	SCM Implementation	Transportation	Packing Challenges
Production & Manufacturing	1	0.202*	-0.015	-0.050
SCM Implementation	0.202*	1	-0.162	-0.073
Transportation	-0.015	-0.162	1	-0.039
Packing Challenges	-0.050	-0.073	-0.039	1

*Significant at the 0.05 level (2-tailed). A statistically significant positive correlation ($r = 0.202$, $p = 0.044$) exists between production and manufacturing outcomes and the implementation of supply chain management, confirming that improved manufacturing practices are associated with higher levels of SCM adoption.

VI. FINDINGS

6.1 Percentage Analysis

The majority (70%) of respondents were below 25 years of age, and females constituted the larger proportion (56%). Most respondents (78%) resided in rural areas, and 40% held graduate-level qualifications. A significant 80% used demand forecasting for production planning, and 70% confirmed that forecasting methods enhance forecasting efficiency. Material resource planning was used by 66% for purchasing, primarily for inventory control (50%).

6.2 Chi-Square Test

Significant associations were found between place of residence, educational qualification, type of family, size of family, and earning members with production and manufacturing outcomes. For supply chain management implementation, significant associations were found with educational qualification and nature of job.

6.3 ANOVA

Educational qualification ($p = 0.002$) and nature of job ($p = 0.000$) significantly influenced supply chain management implementation. All other demographic variables did not exert a significant impact.

6.4 Regression Analysis

Demographic variables collectively explained 12.3% of the variability in SCM implementation ($R^2 = 0.123$). Earning members in the family was the sole significant predictor ($p = 0.003$).

6.5 Correlation Analysis

A significant positive correlation ($r = 0.202$) was observed between production and manufacturing and supply chain management implementation, confirming the interdependence of these functions..

VII. CONCLUSION

This study demonstrates that demand forecasting is an indispensable tool in the supply chain management of logistics firms such as Falcon India Lines Pvt. Ltd. The majority of surveyed employees recognise and actively use forecasting techniques to drive production planning and purchasing decisions. Key statistical analyses confirm that educational qualification and nature of job are the most influential demographic factors affecting supply chain implementation, while earning members in the family is a significant predictor in regression modelling.

A positive and significant correlation between manufacturing performance and supply chain management implementation reinforces the need for integrated operational strategies. As the global logistics sector grows at an estimated 10–15% annually, firms that invest in robust forecasting capabilities and collaborative supply chain frameworks will be better positioned to deliver customer value, optimise costs, and sustain competitive advantage.

In conclusion, demand forecasting is not merely a planning tool but a strategic enabler. Businesses that align their forecasting capabilities with supply chain practices are likely to achieve sustainable growth, stronger customer relationships, and improved operational resilience.

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